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IB No. 87/65
15 March 1965
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Declass Review by NIMA/DOD

MEMORANDUM FOR: Chief, Special Operations Division, DDP

ATTENTION : 25X1A

FROM : Chief, Photographic Intelligence Division, CIA

SUBJECT : Tai-yuan Heavy Machinery Plant

REFERENCES : (1) DDP Requirement No. 38/65
(2) CIA/PID Project No. 30255-5

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1. This memorandum is in response to the referenced requirement which asks for a review of the report on the Tai-yuan Heavy Machinery Plant to include technical accuracy and completeness of information. Also requested was data that would fill intelligence information gaps in the document.

2. The subject report contains much information derived from collateral material; however, there is no way to determine when such material was used to assist in functional identification of buildings. That portion of the report entitled "Detailed Photointerpretation Report" reflects this fact as identifications are made which cannot be made from the photo alone (see section b of paragraph 3 for examples).

3. Obviously a great deal of time was expended on this very detailed analysis. There are several discrepancies between the subject report and a study (IB Memo No. 327/64) previously completed by the Industrial Branch using

a. The dimensions in the subject report, for the most part, are slightly larger than the one prepared by CIA/PID/IB.

b. The subject report makes very positive identifications which absolutely cannot be confirmed by photo interpretation methods alone. Following are a few examples with the CIA/PID/IB identification in brackets.

Central laboratory (Machine shop/workshop)
Standardization shop (Machine shop/workshop)

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SUBJECT: Tai-yuan Heavy Machinery Plant

Molding shop (Machine shop/workshop)
Machinery maintenance shop (Machine shop/workshop)
Electric maintenance shop (Machine shop/workshop)
Products inspection section (Shop)
Calcium carbide plant (Unidentified)
Inflammable storage building (Warehouse)
Logistic area (Unidentified buildings)

c. The largest and one of the most important buildings in the plant was incorrectly identified. The subject report identifies building #7-5 as a "Forging presses shop". The CIA/PID/IB report identifies this building as a "Foundry".

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d. There are other lesser discrepancies in photo interpretation. Following are a few examples:

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4. "Intelligence Information Gaps" are listed in the following groups in the report; (a) Technical Details Relative to Operations against Tai-yuan Heavy Machinery Plant, (b) Safety considerations, and (c) Others - None of these very detailed gaps can be answered by photographic interpretation methods and must therefore be answered by some other means.

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SUBJECT: Tai-yuan Heavy Machinery Plant

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5. The photo analyst assigned to this project was [redacted]
who may be contacted on [redacted] should you have further question
concerning this project. This memorandum completes this requirement.

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TAIYUAN HEAVY MACHINERY PLANT

COPY NO. 1

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PREPARED BY: PROJECT

JULY 1964

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Figure 3. Photograph Showing Environment of Taiyuan HMP

Figure 4. Area Distribution of Taiyuan HMP

Figure 5. Photograph Showing Area Distribution of Taiyuan HMP

Figure 6. Photograph Showing Area Distribution of Taiyuan HMP

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Figure 7. Line Drawing of Cold-working Section

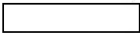


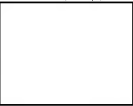
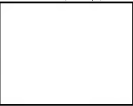

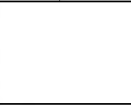
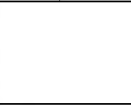


Figure 8. Photograph of Cold-working Section

Figure 9. Photograph of Cold-working Section

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1. Foreword

Since 1949, the Chicom has exerted their utmost in an attempt to bring about a national industrialization, with special emphasis laid on the development of heavy industries. To achieve this, the Chicom 1st Ministry of Machine Industry promulgated, as the first step toward the development of heavy machinery industry, the "Instructions on Rearrangement of State-operated Machinery Industrial Establishments" wherein the following guiding principles were prescribed:

- (1) The existing machinery plants be readjusted and expanded.
- (2) New factories be established and constructed.
- (3) The private-operated machinery plants be incorporated with other¹.

In the Chicom first five-year plan (1953-1957), heavy machinery was listed as one of the key objectives of industrial development along with iron and steel, non-ferrous metals, petroleum and electricity².

25X1A Taiyuan is located in the central part of the Shansi Basin in North China. With temperate climate, the place is surrounded by a vast hinterland abundant in coal and iron and is provided with adequate supporting industries and power and material resources. The place is also conveniently located at the junction of Tat'ung-Fenglingtu and Taiyuan-Shihmen Railroads. All these factors make Taiyuan one of the most ideal industrial centers in China. The Chicom formally chose Taiyuan as the heavy industrial development center for North China in 1950³.

Taiyuan Heavy Machinery Plant (Taiyuan HMP) is one of the 694 important projects listed under the Chicom 1st five year plan⁴. The Plant was purposely constructed to produce heavy machines such as steel making equipment, chemical engineering facilities,

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ore prospecting equipment, weight lifting machines and machine tools.

Construction of the Plant was first started in 1950, however, the bulk of construction was actually gotten underway with the Russian assistance in 1953. The Plant, 180 acres in area, has a capability of producing sufficient coking, forging and weight-lifting equipment for a 1,600,000 ton steel-making plant in a year⁵. The Plant is also designed to be highly versatile so that it can be transformed into an arsenal producing heavy weapons in time of war to meet the national defence requirements⁶. Because of its marked importance, the Chicom had invested as much as JMP\$200,000,000.00 as of 1959⁷.

Taiyuan HMP began its partial production in 1953. Products have been shipped to the support of more than 40 industrial establishments including Anshan () Steel Plant, Wuhan () Steel Plant, and Fu-la-erh-chi () Machinery Plant⁸.

Taiyuan HMP has been photographed 4 times ()

() Photos of the missions revealed that, () most constructions had been completed with only a few still underway.

Taiyuan HMP is estimated to be parallel to the other heavy machinery plants under the 3rd Management Bureau of Machinery Industry, Chicom 1st Ministry of Machine Industry⁹.

The Plant is equipped mostly with Russian-made equipment.

There stationed in the Plant some technical experts from Soviet Bloc countries including Russia, Czechoslovakia, and Poland¹⁰.

The experts left the Plant sometime before and after 1959.

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2. Physical Description

a. Discussion of Target Area

(1) Terrain features:

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Taiyuan HMP is located between Tungshe [] and Wa-liu [], 4 miles west of Taiyuan, in the Fengho (river) alluvial basin. The plant is sited on a fairly flat area with an elevation of 2,500 ft. Yu-tz'u county lies 20 miles to the southeast, and Ch'ing-yuan [] 21 miles to the southwest. The terrain becomes rugged and elevated westwards. Lu-liang-shan runs 3 miles by the west of the Plant. Geologically, the area is primarily composed of reworked loess which is suitable for the plantation of crops. Dry farm fields with villages, mines, and factories are scattered here and there. The area is better known as "Hoshi Industrial Region".

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(2) Weather :

Weather of the Taiyuan Area is of the north China steppe type with a mean yearly temperature of 9.9°C, lowest in January (-8°C) and highest in July (25.2°C). Temperature extremes are 40.5°C (July, 1934) and -23.0°C (January, 1931). The yearly rainfall is 384.1 cm, with the most in months of July and August. The highest monthly rainfall ever recorded is 240 cm (August, 1932). Rainy days count 55 days a year in average. The average cloud is 2.9 and sunshine is 2,200 hrs a year. Wind velocity averages 1.5 m/sec in a year with most SE wind blowing in spring and summer and NW wind in fall and winter. Storms usually occur in March and April. Snow days begin in November and end in March. Hails happen occasionally in June and fogs in winter days. Sandy days are several and usually occur in March and April. The average visibility is

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7.2 km¹¹.

(3) Environment (Figure 2):

Taiyuan HMP, located 4 miles west of Taiyuan city, neighbours Hsi-liu [] 25X1A, Pengts'un [] 25X1A, and Hou-peit'un [] 25X1A by the east; Hsia-yuan [] 25X1A, Ch'i-ta-kou [] 25X1A and Wa-liu by the south; Nanshe 25X1A [] and Yuan-hsia-t'ou [] 25X1A by the west; and Tung-she [] 25X1A and Hsi-wa-liu [] 25X1A by the north. Taiyuan Arsenal and Ammunition Complex is located 13 miles to the NNE. Taiyuan Rocket Plant and the possible Taiyuan Uranium Mine are located 9-11 miles and Taiyuan Iron and Steel Corporation 5 miles to the northeast. On mile to the north lies the Chin-hsi Machinery Plant and 5 miles to the southeast the Taiyuan Airfield. A synthetic chemical plant and a fertilizer plant are situated 4-6 miles south of the Taiyuan HMP and, in the Lu-liang-shan area west of the Plant, there are coal and iron mines.

(4) Communication (Figure 2)

(a) Railroad: Railroad serves as the main transportation for the Taiyuan HMP. A branch railroad leads across Fengho from Taiyuan East Station to the Plant through Taiyuan Iron and Steel Corporation. A marshalling yard is located west of the Plant, where a total of 15 sidings are spurred off the branch railroad to connect the various important shops and warehouse areas of the Plant. The branch railroad joins the Shihmen-Taiyuan Railroad (Cheng-t'ai Railroad) and the Tat'ung-Fenglingtu (Tung-Pu Railroad) at Taiyuan East Station. This makes the Plant within the reach of all major cities along both of them and Lanchou-Tungshai (Lung-Hai) and Peiping-Hankou (Ping-Han) Railroads. Railroads also connect Taiyuan HMP with all

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the neighbouring military and technical installations and mines.

(b) Highway (Figures 2 and 3): The Plant is served by an asphalt-paved road, 45 ft in width, leading to all the nearby installations. Part of the shops within the Plant are served by concrete roads about in width, while the rest by macadam roads varying in width.

(c) River transportation: Fenho (river), though being the biggest river in Shansi Province, is shallow and turbulent. The river is advantageous in irrigation rather than in navigation.

(d) Air transportation: The former Taiyuan Airfield has been used as the site for Taiyuan Iron and Steel Corporation. A new civil airfield, having a runway of approximately 5,000 ft in length, was constructed south of Taiyuan city. The airfield is operational for all types of transports the Chicoms have on hand.

(e) Public utilities:

i. Water supply - A water tower (Figure 11-14) is located by the west and another by the north of Cast Steel Shop (Figure 15-4). These two water towers, together with possible deep wells, supply the Plant with necessary water. Water for the housing area is possibly taken from wells or streams.

ii. Power supply - Power Shop (Figure 11-4), located in the central part of the Plant, provides the whole Plant with necessary electric power. A substation (Figure 15-6) is constructed in the north part of the Plant. Photos show that power lines of the substation are yet to be installed. The substation is estimated to provide electricity for all installations within the Extension Section.

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(f) Telecommunication facilities: On top of the Central Laboratory (Figure 7-1), there are more than 10 antennae in different types. These antennae suggest possible HF radio facilities withing the building for external communications. Telephone is estimated to be the means of internal communication of the Plant.

b. Detailed Photointerpretational Report

Taiyuan EMP is a large, well-equipped plant capable of designing, manufacturing, assembling and repairing various types of heavy machines. The Plant, located in the "Ho-hsi Industrial Region" 4 miles west of Taiyuan city, has been aerial-photographed for 4 times [redacted] Photos obtained, except that of the [redacted] mission flown in the dawn shows substandard image (Figure 4), were all satisfactory. According to the photos, 90 percent of constructions of the Plant were completed before [redacted] The construction of most railroad sidings and the survey of roads within the plant area were also completed then, only the road surface yet to be paved. Constructions were found underway on the vacant ground in the north part of the Plant. It was found later in [redacted] that most of the constructions had been completed and the Plant had been in operation. An interpretation of photos taken in the latest two aerial-reconnaissance missions revealed that activities of the Plant were reducing, suggesting a decrease in production. The Plant which occupies an area of approximately 1 square mile is rectangular in shape with the main entrance located in the central part of the south side. The Plant is secured by a brick wall with guard posts at the main entrance. West of the Plant there are the possible industrial school and the marshalling yard from where a total of 15 railroad sidings were spurred off to connect the principal shops within the Plant. An adjoining classified military factory is located north of the Plant and a housing area and a

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recreation center in its southeast corner. There are two vehicle maintenance shops located to the east.

To facilitate reading, the Plant is arbitrarily divided into 5 parts: Cold-working, Hot-working, Extension, and Administration and Housing Sections and the Adjacent Important Installations which are possibly associating with the Taiyuan HMF. Photos and drawings of the sections and installations are attached to this report with annotations keyed to the text (Figures 5 and 6).

(1) Cold-working Section (Figures 7, 8, 9, and 10)

This section is located in the south part of the Plant, accomplishing design and assembly portion for the whole manufacturing process of the Plant. Major installations in this Section include the Central Laboratory, the Standardization Shop, two assembly buildings, 2 metalworking shops, a molding shop, an oxygen plant, some warehouses and guard houses, and a salvage disposal. Details of the installations are given as follows:

(a) Central laboratory (Figure 7-1) - The main building of the laboratory is rectangular, flat monitor-roofed, concrete-made, and measuring 350 x 200 x 25 ft. On southeast corner of its roof there are more than ten antenna poles. Two L-shaped buildings are located north of the main laboratory building, possible data rooms or production control room.

(b) Standardization shop (Figure 7-2) - A rectangular building measuring 350 x 250 x 25 ft. The high bay section at the east end measures approximately 35 ft in height. Both buildings are monitor-roofed and made of reinforced concrete.

(c) Assembly shop A (Figure 7-3) - A slightly L-shaped, monitor-roofed, concrete building, 580 x 530 x 35 ft

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in dimension. A high bay section is attached to the south side, measuring 800 x 110 x 45 ft. An improved, 100 ft wide macadam road, possibly for vehicle test, is built by the south side. A large graded yard lies west of the building, possibly an assembly or product distribution yard. A material storage yard with two elevated bridge cranes is located by the north. Three small possible office buildings or rest rooms are located by the north. The shop is served by a gas pipe and two railroad sidings. The sidings, one to the material yard and the other to the west end of the high bay section, are estimated to ship in raw materials and ship out products respectively. Both entrances of the shop are located by the east side.

(d) Assembly shop B (Figure 7-4) - A slightly L-shaped building. The bar portion measures 430 x 370 x 35 ft, with a monitor on the central part of the roof and eight short stacks along the north side. This suggests that the shop possibly houses some auxiliary power plants. The lowered east part of the bar portion is possibly the office or rest room. The reinforced concrete high bay section at the stem portion of the building, measuring 550 x 110 x 45 ft, is flat-roofed and installed with 12 vents. A material storage yard with two bridge cranes is located by the west side. The shop is served by three railroad sidings, two to the material yard for shipping in materials and one to the bay section for shipping out products. The shop has two outlets, both located along the south side of the building. —

(e) No. 1 metalworking shop (Figure 7-5) - A rectangular, 430 x 350 x 30 ft, monitor-roofed building. A high bay section is located by the west side, measuring 210 x 80 x 40 ft, all built of reinforced concrete. A material storage yard with one bridge crane is located by the north side of the high bay section. The building is served by a railroad siding ending at the material yard and an elevated gas pipe by the east side. There are two outlets on both the east and the south

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sides of the building.

(f) No. 2 metalworking shop (Figure 7-6) - A rectangular, saw-roofed building with 10 monitors on the roof, measuring 730 x 550 x 35 ft. A bay section, 70 ft in height, is located at the west end. The material storage yard is situated in the northwest corner, equipped with a bridge crane. The building is served by a railroad siding. The main entrance is located at the west end and an auxiliary entrance at the south end of the high bay section.

(g) Molding shop (Figure 7-7) - A rectangular, 440 x 155 x 20 ft building, with its east portion in reinforced concrete structure and the west portion in metal sheds.

(h) Oxygen plant (Figure 7-8) - Including a 140 x 60 ft oxygen preparation building, a 200 x 50 ft warehouse and a 120 x 60 ft office building.

(i) Casting shop (Figure 7-9) - A rectangular, 225 x 140 x 30 ft, monitor-roofed building with a stack attached to it. A material storage yard is located to the east. The material storage yard is served by a railroad siding and the shop building, by a gas pipe. The entrance is located at the west end of the building.

(j) Salvage yard (Figure 7-10) - Comprised of 3 wooden office buildings and two scrap yards, and served by two railroad sidings.

(k) Guard dormitories - A total of 4 buildings in varied sizes (Figure 7-11).

(l) Warehouse area (Figure 7-12) - Located at the west end of the Cold-working Section, this area consists of 3 bar-shaped buildings. One of the buildings, with a monitor, measures 500 x 85 ft and is served by a gas pipe and attached

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by the north side with an office building, and another, located in the southwest part of the Plant, is 390 x 65 ft, flat-roofed and installed with more than 20 roof vents. On both sides of the former, there are material storage yards where a total of 3 bridge cranes are observed. The area is served by two railroad sidings.

Construction of all installations in the Cold-working Section, except the warehouse area, the casting shop, and gas pipes and roads, which were constructed in was completed before

(2) Hot-working Section (Figures 11, 12, 13 and 14)

This section, being the essential portion of the Plant, is situated in the central part of the plant area. It consists primarily of a machinery maintenance shop, an electric maintenance shop, a products warehouse, a power shop, a forging presses shop, the No. 1 heat-treatment shop, a tools manufacturing shop, the consolidated machining shop, a boilers shop, a gas plant, a calcium carbide plant, and the water supply installations. Stated below are details of the installations.

(a) Machinery maintenance shop (Figure 11-1) - A rectangular, 550 x 200 x 25 ft, monitor-roofed, concrete building with 8 possible dust catchers on the west part of the roof.

(b) Electric maintenance shop (Figure 11-2) - A rectangular, 400 x 170 x 25 ft, concrete building with arc-shaped central roof and flat side roofs. A material storage yard is located by the north, served by a railroad siding.

(c) Warehouse area (Figure 11-3) - Including a total of 5 warehouse-type buildings possibly for the storage of reparable machines.

(d) Power shop (Figure 11-4) - This building measures 270 x 90 x 30 ft with three 80 ft high stacks, a spray pond,

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a possible transformer building, 2 conveyors, a coal storage yard equipped with 2 bridge cranes, and 5 other small buildings. The shop is served by a railroad siding and, possibly, some buried power cables.

(e) Forging presses shop (Figure 11-5) - A U-shaped building. The bar portion measures 770 x 275 x 45 ft with 3 liquid tanks on the lowered flat roof at the east end, two stacks, approximately 90 ft in height, by the north side, and two conveyors connecting the shop with gas plant. The east wing, in flat monitor-roofed structure, measures 400 x 210 x 30 ft and is installed with a material storage yard with 2 bridge cranes and one 90 ft high stack by the east side. The west wing, also flat monitor-roofed, measures 350 x 200 x 30 ft with two material storage yards, each equipped with a bridge crane. The shop is served by a gas pipe by the west side and three railroad sidings ending at the bar section and each of the material yards respectively.

(f) No. 1 heat-treatment shop (Figure 11-6) - A rectangular, monitor-roofed, concrete building measuring 550 x 210 x 30 ft. Two stacks, about 90 ft in height, and a material storage yard equipped with two bridge cranes are located by the west side. The building is served by a gas pipe.

(g) Tools shop (Figure 11-7) - A rectangular building measuring 620 x 170 A concrete high bay section with a 85 ft high stack is located in the northwest corner. The shop is served by a railroad siding.

(h) Consolidated machining shop (Figure 11-8) - This shop consists of a machining section and a products inspection section. The products inspection section, which occupies the west part of the shop, is a rectangular flat monitor-roofed building measuring 350 x 85 x 20 ft, with 2 roof vents. The machining section is U-shaped, 600 x 150 ft at the bar portion, 330 x 220 ft

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at the south wing, and 280 x 140 ft at the north wing, all flat monitor-roofed, made of concrete, and about 35 ft in height. On the roof of the south wing, there are 5 roof vents and 3 liquid tanks. One material storage yard is located by each side of the south wing, equipped with a bridge crane. Two railroad sidings end at the south material storage yard and the north wing respectively. The building is also served by a gas pipe. Office of the shop is located by the east side of the building.

(i) Boilers shop (Figure 11-9) - A rectangular building measuring 550 x 180 ft and 30 ft in average height. The north part of the building is a flat monitor-roofed high bay section but the south part is gable-roofed. There are two stacks, one material storage yard, and, by the east side, one possible cooling installation. The shop is served by a railroad siding and a gas pipe, ending at the material storage yard and the shop proper respectively.

(j) Gas plant (Figure 11-10) - This plant comprises of the following installations:

- i. Gas generating building (10 A) - Bar-shaped, 480 x 100 ft, housing more than 15 gas generating furnaces.
 - ii. Spray pond (10 B) - 250 sq ft in five grids, located north of gas generating building, with a possible pump house by the west, probably used for settlement and filtering.
 - iii. Conveyor (10 C) - 15 ft wide, leading from the coal pile to the top of gas generating building.
 - iv. Coal crushing building (10 D) - Located south of the coal pile, possibly for crushing and selecting coals.
- A small office is located by the west side.
- v. Coal yard (10 E) - About 770 x 70 ft, installed with 3 bridge cranes and served by a railroad siding.
 - vi. Two cooling towers (10 F) - Hexagonal, brick-made, 40 ft in diameter and 70 ft in height.

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vii. Chemicals recovery shop (10 G) - Bar-shaped, located south of the cooling tower, with 5 roof vents, possibly for recovering gas byproducts. There are two gas pipes leading from the gas plant to the various major shops.

(k) Calcium carbide plant (Figure 11-11) - Including a 230 x 110 ft, U-shaped plant building, a bar-shaped building, a stack, a possible mixing pond, and two small buildings.

(l) Warehouse (Figure 11-12) - A bar-shaped, 370 x 100 ft, arc-roofed building with a material storage yard, which is equipped with a bridge crane, located by the south. It is served by two railroad sidings, one leading to the material storage yard and the other to the warehouse.

(m) Inflammables storage area (Figure 11-13) - A walled area with two vent-installed warehouses inside it.

(n) Water supply facilities (Figure 11-14) - Including a cylindrical water tower, [] in diameter and 75 ft in height, a pump house and an office building.

Except the gas plant and the material storage yards, which were probably constructed in [] construction of all installations within the Section was found completed in []

(3) Extension Section (Figure 15, 16, 17, and 18)

This section occupies the open area between the Hot-working Section and the Classified Military Factory. This area was annexed to the Taiyuan HMP in [] when the Chicom intended to expand the Plant. According to [] photos, a bulk of construction materials were piled up in the area and several graded land pieces, one with excavations, were observed. The wall separating the Hot-working Section from this Section has been brought down at several places. The Section is served by a road

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25X1D branched off from the main road. Many temporary working sheds were also observed. [] the following installations were found almost completed: Cast Steel Shop, No. 2 Heat-treatment Shop, Hydraulic Presses Shop, No. 3 Metalworking Shop, the warehouses, the substation, the railroad sidings and the water supply installations. Although there were no construction activities observed in [] the piled construction material still suggested that construction of additional installations were likely to be continued. Stated below are details of installations within this Section:

(a) Cast steel and hydraulic presses shops (Figure 15-1) - These two shops are located together in a U-shaped building, the former occupies the bar section and the east wing portion while the latter occupies the west wing portion. The bar section, measuring 570 x 210 x 35 ft, is of reinforced concrete structure and is arc monitor-roofed. On the roof of the bar portion, there are 3 stacks, 2 liquid tanks and 1 tank vent, suggesting that it houses possibly 2-3 open-hearth furnaces. Both the east wing portion, measuring 270 x 120 ft, and the west wing portion, 400 x 200 ft, are arc monitor-roofed and about 30 ft in height. There are 3 material storage yards in middle and by the north side of the building, one with sheds and one with a bridge crane. The building is served by two railroad sidings, one to cast steel shop and the other to material storage yard, and one gas pipe leading from the gas plant to the cast steel shop. Three unidentified buildings, varied in size and partly under construction, were located east of the building.

(b) No. 3 metalworking shop (Figure 15-2) - A rectangular, flat monitor-roofed, concrete building measuring 400 x 200 x 25 ft, with a material storage yard by the east side.

(c) No. 2 heat-treatment shop (Figure 15-3) - This T-shaped shop is separated into the L-shaped east portion

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measuring 200 x 60 x 35 ft with a high bay, 100 ft wide and 50 ft high, and the T-shaped west portion which measures 160 x 60 x 25 ft at the stem and 100 ft wide at the bar. The building is attached with a stack by the north side.

(d) Water supply facilities (Figure 15-4) - Including a cylindrical water tower [] in diameter and 65 ft in height, a pump house, an office building, and several nearby unidentified buildings under construction.

(e) Warehouse area (Figure 15-5) - This area consists of more than 20 warehouse-type buildings, possibly temporary sheds, and several constructional material storage yards.

(f) Substation (Figure 15-6) - A walled area with 2 entrances, 250 x 260 ft in size, installed with 2 large and 11 small transformers and an office building. The substation is lighted in the corners. Ditches were evidenced in the [] possibly for burying underground cables.

(g) Excavation (Figure 15-7) - 1400 x 200 ft, formerly the site of 5 buildings [] which were later brought down with more than 10 temporary sheds still left unmoved.

(h) Housing area (Figure 15-8) - A total of more than 30 buildings in varied sizes built before [] The buildings are estimated belonging to the adjoining Classified Military Factory.

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According to the last aerial reconnaissance mission flown in [] all shops in Extension Section were not operational then.

(4) Administration and Housing Area (Figure 19 and 20)

This Section is located at the south end of the Plant. Apart from those build for administration purposes, all

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buildings were located outside the wall of Taiyuan EMP. Major installations within the Section are the main office building, general supply warehouses, a motor pool, the administration buildings, a housing area, a playground, a primary school, a hospital, a shopping center, an open-air theatre, a library, a recreation center, the bachelors' quarters, and a vehicle maintenance yard.

- (a) Main office building (Figure 19-1) - A rectangular, possibly 3-story building with a high bay section in the central part, measuring 230 x 60 x 40 ft.
- (b) Main entrance (Figure 19-2) - With a reception room and a guard house built at the opposite sides of the entrance and a "STOP" bar placed across it.
- (c) Side gate (Figure 19-3) - Leading to the recreation center, installed with a guard house and a "STOP" bar.
- (d) General supply warehouses (Figure 19-4) - Consisting of more than 30 warehouse-type buildings in varied sizes.
- (e) Motor pool (Figure 19-5) - Including despatch control rooms, maintenance buildings, and parking lots.
- (f) Administration area (Figure 19-6) - A total of more than 10 buildings partly under trees.
- (g) Housing area (Figure 19-7) - Consisting of more than 100 quarters-type buildings.
- (h) Playground (Figure 19-8) - Including a reviewing stand, a 400-meter track and field yard, and several basket and volley ball courts.
- (i) School (Figure 19-9) - A building with an assembly yard, possibly a primary school.
- (j) Hospital (Figure 19-10) - One I-shaped building and three others.
- (k) High class quarters area (Figure 19-11) - Four independent quarters-type buildings, one I-shaped building,

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measuring 200 x 60 x 35 ft with a high bay, 100 ft wide and 50 ft high, and the T-shaped west portion which measures 160 x 60 x 25 ft at the stem and 100 ft wide at the bar. The building is attached with a stack by the north side.

(d) Water supply facilities (Figure 15-4) - Including a cylindrical water tower [] in diameter and 65 ft in height, a pump house, an office building, and several nearby unidentified buildings under construction.

(e) Warehouse area (Figure 15-5) - This area consists of more than 20 warehouse-type buildings, possibly temporary sheds, and several constructional material storage yards.

(f) Substation (Figure 15-6) - A walled area with 2 entrances, 250 x 260 ft in size, installed with 2 large and 11 small transformers and an office building. The substation is lighted in the corners. Ditches were evidenced in the [] mission, possibly for burying underground cables.

(g) Excavation (Figure 15-7) - 1400 x 200 ft, formerly the site of 5 buildings [] which were later brought down with more than 10 temporary sheds still left unmoved.

(h) Housing area (Figure 15-8) - A total of more than 30 buildings in varied sizes built before [] The buildings are estimated belonging to the adjoining Classified Military Factory.

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and five others.

- (l) Assembly hall (Figure 19-12) - Measuring 220 x 150 ft.
- (m) Shopping center (Figure 19-13) - A total of seven buildings in varied sizes.
- (n) Open-air theatre (Figure 19-14) - With a stage, and a spectators' sector.
- (o) Library and recreation center (Figure 19-15) - Two possibly two-story buildings.
- (p) Housing area (Figure 19-16) - A total of 44 buildings in varied sizes, possibly for the bachelor workers.
- (q) Vehicle maintenance yard (Figure 19-17) - One maintenance shop, and 4 other buildings parked with more than

20 vehicles in different types.

Most of the installations in this Section were build in

(5) Adjacent Important Targets.

- (a) Classified Military Factory (Figures 21, 22, 23, and 24)

This factory adjoins Taiyuan EMP by its north side and is highly-secured. Installed with several unidentified installations, the factory is separately built and not directly accessible from the Taiyuan EMP. However, it is believed that they are more or less co-related in view of their close neighbourhood. Details of installations within the factory are given as follows:

- 1. Assembly shop A (Figure 21-1) - A slightly square, concrete building, 510 x 420 x 30 ft, flat monitor-roofed and served by a railroad siding and a gas pipe.

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ii. Assembly shop B (Figure 21-2) - A rectangular, monitor-roofed building measuring 450 x 300 x 25 ft and served by a railroad siding and a gas pipe.

iii. Administration area (Figure 21-3) - Located east of the factory, the area is composed of 8 buildings including possibly office buildings, laboratories and data rooms.

iv. Logistic area (Figure 21-4) - Including warehouses, maintenance shops, a gas control room, and a motor pool.

v. Gas pipe (Figure 21-5) - Gas required by the factory is taken through an elevated pipe system from the neighbouring Chin-hsi Machinery Plant located to the north.

vi. Excavation (Figure 21-6) - This excavation measuring 750 x 520 ft was completed in [] but was found flattened out in [] The construction seemed continuing in [] as there were new constructional materials piled up there.

vii. Thermal power plant (Figure 21-7) - Construction was found starting in [] and about 60 percent complete in [] The coal-ferrying railroad siding was found under construction.

viii. Unidentified shop (Figure 21-8) - A L-shaped, flat monitor-roofed building measuring 210 x 150 at the stem and 310 x 100 ft at the bar (both about 30 ft in height). Three short stacks are located on the roof and a material storage yard is by the south side. Three high stacks are scattered east, south and west of the building separately. Besides, there are about 10 buildings, possibly the laboratories, operation rooms, and warehouses, scattered around it, some under trees. The shop is served by a single road.

ix. Special warehouse area (Figure 21-9) - A walled area containing 24 warehouse-type buildings in varied sizes.

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(b) Industrial School (Figure 21-A) - This school is located 1 mile west of Taiyuan HMP, containing approximately 20 classroom-type buildings, 5 shop-like laboratories and a playground.

(c) Railroad marshalling yard (Figure 2-B) - Located west of Taiyuan HMP, consisting of a main line marshalling and a spur line marshalling yards with a total of 13 marshalling sidings, two platforms, one coaling and watering station, and one storage area.

(d) Vehicle Assembly and Maintenance Depot (Figure 2-C) - Located half a mile east of Taiyuan HMP, the depot consists of 11 maintenance buildings and some 30 others. About 30 vehicles were found parking there.

(e) Chin-hsi Machinery Plant (Figure 2-D) - This is a large-scale machinery plant located 1.5 miles north of Taiyuan HMP. Major installations of the plant include some 20 shop buildings, a gas plant, a thermal power plant, a substation, and the warehouse, administration and housing areas.

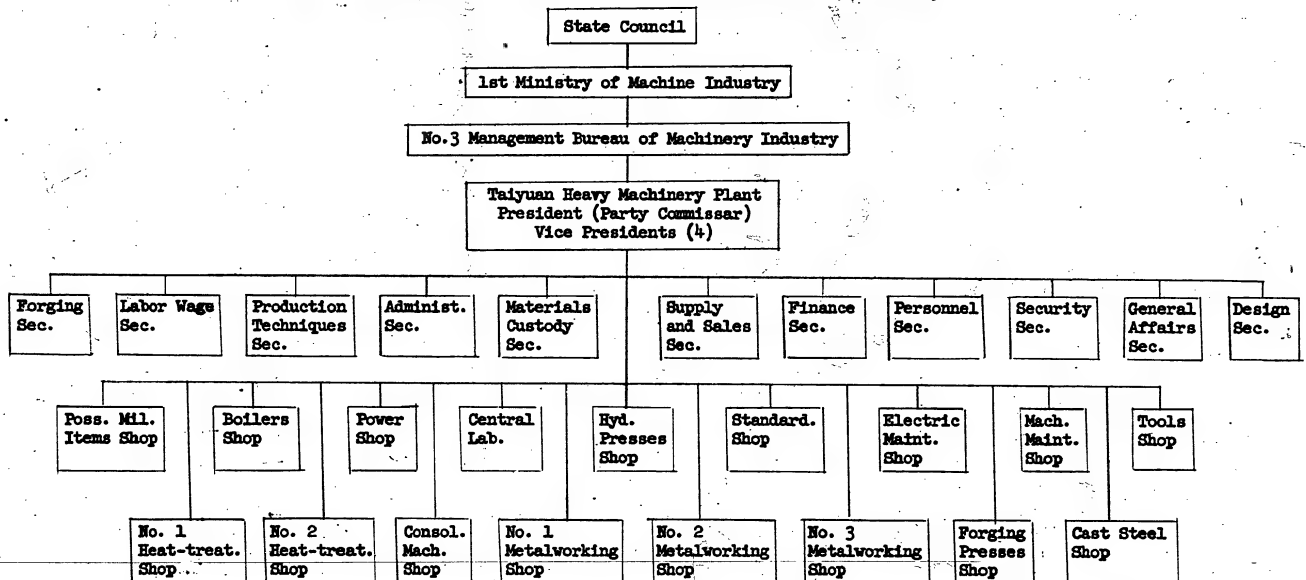
3. Technical Aspects

a. Organization

Under the Chicom First Ministry of Machine Industry, there are No. 2 and No. 3 Management Bureaus of Machinery Industry in charge of the control of machine tool plants and heavy machinery (including mineral machinery) plants respectively. Taiyuan HMP is estimated to be under the No. 3 Management Bureau of Machinery Industry. An estimated organizational structure of Taiyuan HMP is given as follows:

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Chart 1: Estimated Organizational Structure of Taiyuan Heavy Machinery Plant



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Under each shops, there are specialized teams established to meet the specific requirements of works assigned.

There was also the Foreign Experts' Office established before 1959 when technical experts from Communist bloc countries were stationed at the Plant. The Office seems to have been deactivated since the withdrawal of the experts in 1959. Besides, information obtained reveals that some classified shops manufacturing military items are in existence at the Plant¹², however, the exact number and characteristics of the shops and whether they refers to the adjoining Classified Military Factory are pending further information to confirm.

b. History

Taiyuan HMP is the first heavy machinery plant designed and constructed by the Chicoms themselves. Construction of the Plant was first started in [] The Project was later regarded as one of the top-priority items under the 1st Five-year Plan (1953-1957). Though the Chicom started intensifying the construction in [] the project progressed sluggishly due to mistakes in design and those made during the course of construction. Important installations, such as cast steel, forging presses, No. 1 and 2 metal-working, consolidated machining, No. 1 heat-treatment, tools manufacturing, machinery maintenance, standardization, electric maintenance, and boilers shops, the central laboratory and the gas plant, originally scheduled to be completed in 1956 were actually started construction and installation of equipment in [] because of readjustment in design and siting. These installations were almost completed in [] The construction and equipment-installation of cast steel, hydraulic presses, No. 3 metalworking and No. 2 heat-treatment shops were also completed by the end of []

Following are the important equipment installed at the Plant¹³:

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- (1) Two 30-ton open-hearth furnaces at cast steel shop.
- (2) One 3,000-ton hydraulic press at hydraulic presses shop.
- (3) 15 self-made gas generating furnaces at gas plant.
- (4) Radioisotope flaw detectors.
- (5) Several thousand sets of machine tools including large milling machines and others.

Taiyuan HMP began partial production in ☐ Products so far known include¹⁴:

(1) Gantry cranes - 31 m in height, weighing approximately 500 tons, consisting of at least 30,000 parts, capable of lifting a weight of 35 tons to as high as 72 m, designed for two months and trial-manufactured for less than a year by some 30 technicians.

- (2) Large steel rolling machines (Figure 25).
- (3) 760 x 1,200 silicon steel slabbing machines (yield 3,000 to 5,000 tons of silicon steel plates a year).
- (4) Imitations of Czech 3,000-5,000 ton hydraulic presses.
- (5) 150-ton bridge cranes.
- (6) Mining equipment - 1,200 and 3,200 ft drilling machines, winches, and electrically-driven shovels.
- (7) Air compressors.
- (8) Chemical engineering equipment.
- (9) Machine tools - Include the "Pioneer Brand" 9-purpose lathes capable of internal and external grindings, hand-milling,

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up-straight milling, boring, drilling, punching and planing (Figure 26).

- (10) Gas generating furnaces.
- (11) Open-hearth furnaces.
- (12) Tractors (can be modified into tanks in case of war).
- (13) Alloying electric furnaces.
- (14) Coking furnaces.

Besides, the Plant produced in 1962-1963 some 43 other new products.

Summing up the above-mentioned, Taiyuan HMP is apparently a relatively modern, multi-purpose, large-scale heavy machinery plant. Judging from the usual practice of the Chicom in keeping the industrial pace with the national defense requirements and basing on the information that there are military items shops at the Plant, Taiyuan HMP is estimated to be more likely one of the links in the chain of Chicom national defence industries than merely a heavy machinery production unit. This supposition has plentifully supported by the report that the Plant can produce tanks or armored trucks in time of war. It is further estimated that the Plant, in addition to its provision of machinery support to the Chicom ordnance and ammunition industries, is also heavily involved in the Chicom rocket and missile program and, possibly, even the atomic energy program. There are many installations at the Plant yet to be identified and some of them pending construction. Besides, constructions are also underway in the adjoining Classified Military Factory which, being highly secured (with both outer and inner walls, a single entrance, and guard posts in the corners), seems not to be an ordinary machinery plant. Taking into

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consideration the existence of a rocket manufacturing plant and a possible uranium plant around Taiyuan, that this classified factory is an integral constituent within the Chicom missile and rocket or atomic energy program is highly probable. Though, due to shortage of collateral information, the exact function of the factory is unknown, it, however, would be reasonable to infer that the factory is involving in the trial-manufacture of missile and rocket parts, components, and ground support equipment and even missile and rocket bodies.

c. Function and Constructional Structure of the Various Facilities

A complete machine production system includes at least the following work procedures: design, molding, casting, forging, machining, finishing, assembling and inspection. Following are brief statements on functions of each of the procedures:

- (1) Design room - To draw blue prints in accordance with the established specifications and requirements to serve as basis for manufacturing. The design room of Taiyuan HMP is estimated located in the main office building.
- (2) Molding shop - To make models, casting molds and patterns. The molding shop of Taiyuan HMP is establish to meet this requirement.
- (3) Casting shop - To pour molten metals into molds for a given shape. Taiyuan HMP has cast steel and casting shops to perform this function.
- (4) Forging shop - To make steels or wrought iron tougher and stronger. The forging presses shop of Taiyuan HMP is the unit assigned for this purpose.
- (5) Machining shop - To manufacture simple machine parts and components. All the three metalworking shops of Taiyuan HMP are capable of doing this task.

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(6) Mechanical shop - Cast and forged machine parts and components are processed in size to meet the required specification at this shop. The metalworking shops and the consolidated machining shop of Taiyuan HMP are shops of this category.

(7) Assembly shop - This is where machine parts and components are collected and assembled. There are assembly shops at Taiyuan HMP in charge of this mission.

(8) Inspection office - Assembled machines are inspected for proper specification and functioning. Products inspection of Taiyuan HMP is estimated one of the responsibilities of the standardization shop and the central laboratory.

Since Taiyuan HMP is a highly mechanized, independent heavy machinery plant, its production process is naturally far more complicate than that of ordinary machinery works. Based on the available information, Taiyuan HMP has, in addition to the above mentioned installations, some other supporting units such as heat-treatment, hydraulic presses, electric maintenance, machinery maintenance, power, and tools manufacturing shops and gas, oxygen, and calcium carbide plants.

According to the date of construction, the installations can be divided into two categories, those constructed before and those after ☐. Of the first category, there are the power, Nos. 1 and 2 metalworking, No. 1 heat-treatment, tools manufacturing, machinery maintenance, electric maintenance, standardization, and assembly shops. Of the second category, there are cast steel, No. 3 metalworking, No. 2 heat-treatment, and hydraulic presses shops.

The installations are distributed in the following 3 sections. Cold-working Section, Hot-working Section, and Extension Section.

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The characteristics and functions of major installations in the 3 sections are stated seriatim below. The adjoining Classified Military Factory, which is estimated to be closely related with Taiyuan HMP because of its location, is also stated.

(1) Cold-working Section (Figure 7)

Located southmost of the Plant, the Section, except the casting shop (Figure 7-9), possesses no melting furnaces nor stacks. Major installations in this Section are the main office building (Figure 19-1) housing possibly the design and drawing units, the central laboratory (Figure 7-1), oxygen plant (Figure 7-8), and standardization, Nos. 1 and 2 metalworking, assembly, and molding shops (Figure 7-2, 3, 4, 5, 6, and 7). This Section, together with the machinery maintenance, electric maintenance, forging presses, and No. 1 heat-treatment shops in the Hot-working Section (Figure 11-1, 2, 5, and 6) constitutes a complete basic machinery manufacturing system for the Taiyuan HMP.

It is estimated that design of specifications and drawing of blue prints are made at a design and drafting room in the main office building. The blue prints, after being checked by standardization shop, are forwarded to molding shop for making models, patterns, and casting molds. The models, patterns and molds are checked and tested by the central laboratory and then sent to casting shop for casting or to other shops concerned for necessary actions. The semi-products, having been machined at metalworking shops and assembled at assembly shop, are stored at warehouses or shipped out by railroad by the west side of the Plant.

Design and drafting room are equipped with necessary design and drafting instruments. The central laboratory is possibly installed with physical and chemical test sections. The physical test section may have been equipped with precision

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measuring and test instruments such as universal testing machines, hardness testers, compression testers, tensiometers, fatigue testing machines, etc., while the chemical test section is equipped with material analytic instruments and sampling equipment. In molding shop, there must be motor-driven woodworking equipment and tools. Oxygen plant includes an oxygen generating building housing oxygen generators and chargers and some material and oxygen warehouses. It is estimated that oxygen is produced by the liquid air distillation method. If this estimation is true, the oxygen plant must be equipped with air compressors for the liquefaction of air and fractional distillation equipment for the separation of oxygen from nitrogen and other rare gases. Nitrogen obtained may be shipped out for the preparation of explosives, nitric acid and fertilizers, while oxygen is filled in cylinders and stored in warehouses for use.

Casting shop is equipped with a blast-type smelting furnace, capacity of which is unknown, using gas as its fuel. Sand casting, permanent mold casting, pressure die-casting, centrifugal casting, shell-mold casting, and investment casting are all possible practices of casting shop. The workload, however, seems limited in view of the lack of stockpile of molds or cast parts outside the shop building.

No. 1 metalworking shop (Figure 7-5) is estimated to be the preliminary machining shop. As the shop is not served by gas pipes, energy required by the shop to operate its equipment is likely come from an electric motor which drives a main shaft with movable or adjustable pulleys or friction wheels on it. The pulleys, in turn, transmit the rotational force to machine parts by means of gears or belts. Possible equipment of the shop are machine lathes such as automatic lathes, turret lathes, cutting machines, shearing machines, do-all machines, milling machines, shapers, planers, etc.. The primary

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purpose of this shop is estimated to be the machining of machine bodies and large components. There are the Ordnance Machines and the Wheels and Shafts Sepcialized Teams established under this shop.

No. 2 metalworking shop (Figure 7-6) is estimated to be the precision machining shop in charge of such basic machining procedures as drilling, milling, grinding, trimming, smoothing, and parts manufacturing. Therefore, the shop is possibly installed with drilling machines, milling machines, grinders, sand blasts, rivetting machines, gearing machines and other small machine lathes.

Assembly shop has two separated shop buildings (Figure 70-3 and 4). The north one, or Building B, is estimated to be the assembly and inspection building for machine products. All machine parts manufactured are gathered here to be assembled up, painted, numbered, and inspected. The products, after being treated against corrosion, are shipped out by railroad or stored in warehouses. The building is estimated installed with facilities necessary for accomplishing assembly, quality control and inspection of product machines. Building A, which is located south of Building B, is similar in nature as Building B but is estimated with vehicles (tractors or tanks) as its end products. This estimation is supported by the broad road by its south side and the open area to its east, both are likely to be used for the field test of vehicles or tanks it assembles.

There are rectangular high bay sections located at east end of No. 1 metalworking shop, west end of No. 2 metalworking shop, and south end of Assembly Buildings A and B, possibly housing traveling cranes or like facilities.

In the southeast corner of the roof of No. 1 metalworking shop, there are 8 vents and 2 unidentified spots.

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It is estimated that there is possibly a welding or fastening unit under them. The waste oxy-acetylene or oxyhydrogen flame gases can be vented through these vents.

The various installations in this Section are all served by railroad sidings and all-weather roads. Most of the buildings are installed with traveling cranes and material storage yards, reflecting the installation therein of bulky and highly mechanized equipment.

(2) Hot-working Section (Figure 11)

This section is located north of the Cold-working Section, consisting of Gas Plant (Figure 11-10), Calcium Carbide Plant (Figure 11-11), Machinery Maintenance, Electric Maintenance, Power, Forging Presses, No. 1 Heat-treatment, Tools Manufacturing, Consolidated Machining, and Boilers Shops (Figure 11-1, 2, 4, 5, 6, 7, 8 and 9), and a constructional material storage area. This Section supplies most materials and all power for the Taiyuan HMP.

Coals are shipped in by railroad and unloaded at the coal pile located north of gas plant. The coals are sent to the gas plant by a conveyor. The gas generating building houses about 20 gas generating furnaces, 15 out of them are made by Taiyuan HMP itself. Gases are directed by a duct to assembly, No. 2 metalworking, and casting shops in the Cold-working Section, the important installations in this (Hot-working) Section, and Cast Steel Shop (Figure 15-1) in Extension Section. In view of the existence of a spray pond and two cooling towers around the gas plant, it is estimated that there is a chemical recovery installation (Figure 11-10G) affiliated to the gas plant to recover other chemicals from the gas generating process. Cooling water is thought to be taken from a deep well somewhere in this Section rather than from the water tower.

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Calcium Carbide Plant (Figure 11-11), located southeast of gas plant, is possibly a calcium carbide processing or acetylene generating shop whose products are used by the various shops for cutting or welding materials or structures. This plant houses possibly several calcium carbide furnaces, acetylene trappers and cylinder refilling facilities. A warehouse is located by the south side, housing possibly calcium carbide materials, and a walled area by the east side, possibly the storage area for inflammable chemicals.

Adjoined to the south edge of gas plant is the Forging Presses Shop (Figure 11-5), the essential part of the Taiyuan HMP, where forging, forming, extruding, stamping, roll forming, roll bending, spinning and sintering of materials and machines are accomplished. Drop hammers, forging presses, bending rollers, impact extrusion presses and punch presses are all possible equipment in operation at this shop. Forging Presses Shop is strongly constructed and installed with heavy material handling facilities, material storage yards and dies stockrooms. Due to the fact that most works done at this shop are of hot-working, ventilation of the shop building should be strongly emphasized. There are 3 liquid tanks on top of the material storage shed by the east side of the building, containing possibly water, detergent, etc. required for the cleaning of materials before being processed.

No. 1 Heat-treatment Shop (Figure 11-6) and Tools Manufacturing Shop (Figure 11-7) lie east of forging presses shop. Tool manufacturing shop supplies probably the whole Plant with necessary hand tools and special tools and provides calibration for all prime measuring equipment of the Plant. It is most probably equipped with reheat furnaces and the necessary machine lathes. The purpose of a heat treatment shop is to acquire appropriate workability of metals including hardness, toughness, and ductility

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so as to meet the designed requirements of machines. A heat-treatment shop, in order to be capable of conducting various metal treating processes, should be equipped with such equipment as reheat furnaces, cooling baths, carburization furnaces, water or oil quenching baths, annealing furnaces, travelling cranes, hot pieces handling systems, etc..

Power Shop (Figure 11-4), located west of forging presses shop, is fueled by coal which is sent to the shop by a conveyor. With two plant buildings and a total of 3 stacks, the shop is estimated to have been installed with 3 complete generator sets, two for lighting and power purposes respectively and one as a spare. Bus bars, switch panels and transformers are all probably installed in-doors and power lines are possibly buried underground.

Electric Maintenance Shop (Figure 11-2) is estimated responsible for the maintenance of electric apparatus and instruments installed at or used by the various shops. Machinery Maintenance Shop (Figure 11-1), located west of electric maintenance shop, provides machinery maintenance and repair services for the whole Plant. The special vents on its northern roof are possibly to vent harmful fumes such as waste acetylene and paint sprays.

West of machinery maintenance shop, there is a water tower supplying possibly drinking water for both the Hot-working and the Cold-working Sections. A warehouse area (Figure 11-3) is located north of machinery maintenance shop, possibly for the storage of medium and small size products.

Besides, there are Boilers Shop and the Consolidated Machining Shop located in this Section. Boilers shop (Figure 11-9), probably constructed for the production, assembly, and maintenance of boilers, is likely equipped with power presses and punch presses, sheet metal and welding equipment, and pressure testing instruments. The consolidated machining

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shop (Figure 11-8) receives work orders from in- or off-plant units for nonprogrammed machinery maintenance and production. This shop is estimated installed with various general-purpose machine tools and equipment.

(3) Extension Section (Figure 15)

Most installations within this Section were built after ☐ some are still under construction. The construction of this Section seems to be aimed at the boosting of productivity of the Plant. Given below are descriptions of the major installations in this Section.

Cast Steel Shop (Figure 15-1) - This Shop has been installed with two open-hearth furnaces and one electric furnace, both Chicom made. It is difficult to infer the exact purpose of the shop since both open-hearth furnace and electric furnace are required only in steel making which is not a part of heavy machinery manufacturing. However, the furnaces can as well be explained as being installed for either or all of the following purposes: (1) Carburization or retreatment of steel materials; (2) Disposition of waste iron or steel; (3) Making of special alloy steels by the electric furnace for the Plant's own use. Gas is used as fuel for the open-hearth furnaces. The shop is possibly partly equipped with steel-making equipment but performs no complete steel-making process.

Hydraulic Presses Shop (Figure 15-1) is probably installed with several hydraulic presses, one out of the total is known to be 3,000 ton in capacity.

No. 3 Metalworking Shop (Figure 15-2) and No. 2 Heat-treatment Shop (Figure 15-3) are located east of cast steel and hydraulic presses shops. These shops seem to be intended for processing semi-products of cast steel and hydraulic presses

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shops exclusively. Shop layouts and internal facilities of the two buildings are estimated to be similar to those of the other metalworking and heat-treatment shops.

A substation (Figure 15-6), appearing to be unused, has been under construction to provide electricity for all shops already built or to be built in this Section. The substation is installed with 11 small and 2 large transformers. A building within the substation houses possibly bus bars, control switches, and instrument panels. Power is taken into the substation through a set of buried cables and, after being transformed, is conducted to various shops by an elevated line (not installed yet) or underground cable system.

The constructional material storage area located east of No. 2 heat-treatment shop is the place where constructional materials required for the new constructions within this Section are stored. There are also a water tower and several buildings within the area. The buildings are estimated to be the constructional material processing and storage buildings.

Railroad Control Center (Figure 15-9) is a square, single-storied building located west of the constructional material storage area. This center exercises control over all railroad transportation to and from the Hot-working and the Cold-working Sections. Judged from the simple structure of the building, the control method seems to be rather primitive; no modern control devices appear to have been installed.

An excavation in the east part of this Section seems built for a large shop building. Taking into consideration the deep ditch connecting the excavation with the substation and the lack of a large electric machinery shop in Taiyuan EMP, it seems likely that the excavation is to be used for the building of a large electric machinery shop.

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(4) The Adjoining Classified Military Factory (Figure 21)

This highly-secured facility seems in close relationship with either the Chicom's missile and rocket or the atomic energy program. It possibly functions the manufacture and assembly of missile and rocket bodies and ground-supporting equipment or the trial-manufacture of equipment required in the development of atomic energy. The Factory has a consolidated assembly building (Figure 21-1), a general assembly building (Figure 21-2), and the associating facilities. An excavation (Figure 21-6) measuring as large as the total of the two assembly buildings in floor space, is located in the central part of the Factory. The excavation seems to be used for the construction of a consolidated manufacturing shop. A walled area (Figure 21-8) is located west of the excavation, estimated to be a research and preparation area for metallic materials. Materials, samples used, and products are possibly stored in a highly-secured, double-walled warehouse area (Figure 21-9) located westmost of this Factory.

The Factory is served by a gas pipe leading from the neighbouring Chinhsi Machinery Plant. Electricity is estimated also come from that plant. South of the excavation in this Factory, there is a foundation for a power plant (Figure 21-7) which, when constructed, will make the Factory self-sufficient in electricity.

Personnel of this Factory are separately quartered in a housing area (Figure 15-8) located in the central part, slightly to the east, along the north side of Extension Section. Further technical description of this Factory seems impossible due to the limited information available.

According to the existing installations of Taiyuan HMP, an estimated production flow chart is developed as follows:

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Chart 2, Estimated Production Flow Chart of Taiyuan Heavy Machinery Plant

SECTION	PRODUCTION PROCEDURE								GENERAL PURPOSE INSTALLATIONS
Cold-working Section	Design Room	Standard Shop Central Lab.	Molding Shop	Casting Shop	No. 1 Metalworking Shop	No. 2 Metalworking Shop	Assembly Shop	Warehouse	Oxygen Plant
Hot-working Section	Forging Presses Shop	Mach. Maint. Shop Elect. Maint. Shop Tools Manuf. Shop Boilers Shop	No. 1 Heat-treatment Shop			Consol. Machining Shop	Warehouse		Power Shop Gas Plant Calcium Carbide Plant
Extension Section	Cast Steel Shop	Hydraulic Presses Shop	No. 3 Metalworking Shop	No. 2 Heat-treatment Shop	Warehouse				
Classified Military Factory	Consolidated Assembly Shop General Assembly Shop								Material Trial-manuf. Area Classified Warehouse Area

————— Production Line
 - - - - - Technical Support Line

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In short, Taiyuan HMP is conveniently located in a iron-coal abundant area. The large-scale plant, if fully equipped, is capable of producing heavy machines including mining, power generation, chemical engineering, and weapons manufacturing equipment and machine tools. If the Plant is further installed with modern equipment, its production of modern weapon systems is also highly possible. However, the Plant seems still far from being capable of carrying out mass production and how precise are its products is another big question.

Following are the estimated emphases laid by the Chicom in developing Taiyuan HMP:

- (1) To expedite the construction of shop buildings within the Extension Section and the equipment of them;
- (2) To modernize the existing equipment;
- (3) To strengthen automation so as to achieve mass production and standardization of products;
- (4) To improve the precision and to expand the variety of products;
- (5) To gear with the Classified Military Factory in supplying mechanical equipment required in the development of pioneer sciences and the production of modern weapon systems.

d. Physical Security

According to Chicom order of battle (MND, 30 Nov. 1963), there are the following Chicom ground units deployed in the Taiyuan Area:

<u>Unit Designation</u>
61st Division, 21st Corps

<u>Strength</u>
12,100

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+ 62nd Division, 21st Corps	12,100
63rd Division, 21st Corps	12,100
Supporting units, 21st Corps	5,000
554th Regiment, AAA Command (Stationed at Yu-tz'u)	1,700
Total	43,000

The Chicom AAA disposition around Taiyuan is unknown.

Chart 3, which follows, lists Chicom radar disposition around the Taiyuan Area.

Chart 3, Chicom Radar Disposition Around the Taiyuan Area

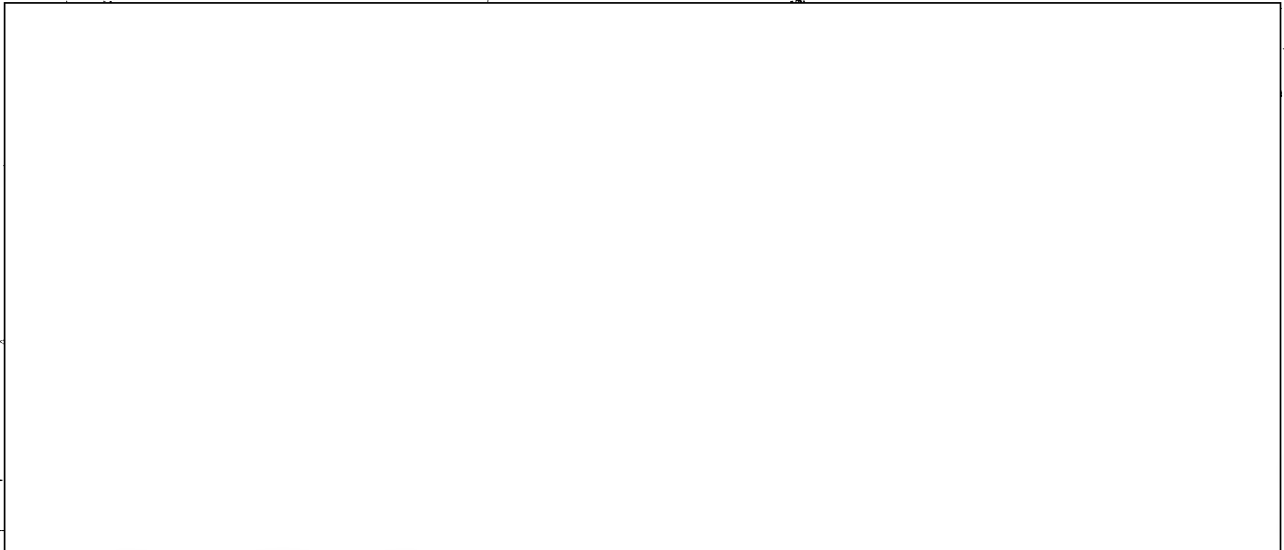
<u>Site Location</u>	<u>Coordinates</u>	<u>Type</u>	<u>Function</u>	<u>Date of Establishment</u>
Taiyuan	3754 N 11336 E	KNIFEREST B	EW	Dec. 1961
Linfen	3603 N 11130 E	MOONCONE	EW	Aug. 1963

There is one airfield at Taiyuan, with a runway approximately 5,100 ft in length. Yu-tz'u Airfield having a 5,300 ft runway lies about 50 miles to the southeast. Besides, there are Linfen and Chu-fu Airfields in Shansi Province, providing ample air convenience.

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4. Personnel Associated with Taiyuan HMP

Taiyuan HMP had, in some 11,000 staffs and workers. The number was reduced to 7,000 in Persons work on a

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rotational basis in three shifts a day, eight hours a shift. Personalities of the Plant so far discovered are:

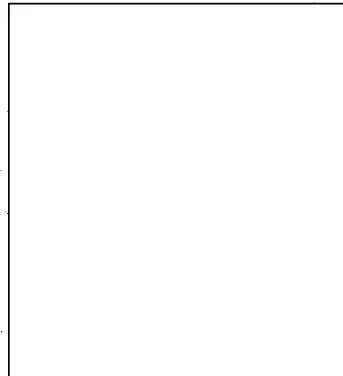
President and Party Commissar

Chief Designer

Forging Section Chief

Engineer

Technicians



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The Plant was formerly stationed with some experts from Soviet Bloc countries including Russia, Czechoslovakia and Poland. The experts left the Plant in and after ☐ 25X1D

5. Intelligence Information Gaps.

a. Technical Details Relative to Operations against Taiyuan HMP:

- (1) Details of type, specification, location, and source of equipment installed in Taiyuan HMP.
- (2) Details of the production process and power supply of the Plant.

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- (3) Detailed shop layouts, functions and responsibilities, and standing operating procedures of the various shop buildings of the Plant.
 - (4) Types, sources and consumption records of the various raw materials used by the Plant.
 - (5) Types, specifications and location of storage warehouses of products.
 - (6) Detailed information concerning modern weapon systems manufactured or supported by the Plant.
 - (7) The true status including missions, equipment, operations, and achievements of the Classified Military Factory.
 - (8) Location and capacity of water sources.
 - (9) Exact purposes of the various warehouses.
 - (10) Means of connection among shop buildings.
 - (11) Line charts of gas piping and underground cable systems.
- b. Safety Considerations:
- (1) Format of special entry clearance and the checking procedures.
 - (2) Size, equipment, work shift, and housing conditions of the guard force.
 - (3) Number of workers, work shift, and management system of the various shop buildings.
 - (4) Security and anti-idling measures.
 - (5) Size and organization of the local militia forces.
 - (6) Means of emergency communications and the exact location of tele-communication installations.

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(7) Type and location of fire-fighting facilities.

c. Others:

- (1) Organizational structure, function and responsibilities, and responsible personalities of Taiyuan HMP.
- (2) Construction history of each of the buildings.
- (3) Specific designation numbers and P.O. box numbers assigned to Taiyuan HMP and its subordinate units.
- (4) Restrictions imposed on the personnel of the Plant.
- (5) Number of alien personnel working or worked in Taiyuan HMP. Give names and specialties of them.

6. References

a. Document Intelligence

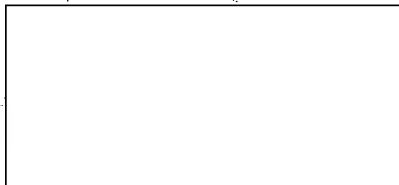
- (1) "Study of the Chicom 1st Five-year Plan", Ministry of Judicial Administration, 1961.
- (2) "An Analysis of the Chicom 1st Five-year Plan", by Cheng Chiu-yuan, Liberty Press, 1961.
- (3) Wen Hui Pao, Hongkong, 16 Oct. 1959.
- (4) "Investigation of the Status of Shansi Province", Ministry of Judicial Administration, Oct. 1961.
- (5) "Periodical Intelligence Report", Hq. Chinese Army, 22 Jan. 1964.
- (6) "Daily Briefs on Chicom Affairs", Ministry of National Defense, 10 May 1963.
- (7) "A Survey of Chicom Iron and Steel Industry", Ministry of Judicial Administration, Feb. 1959.
- (8) "Shansi Daily News", 10 Aug. 1957.

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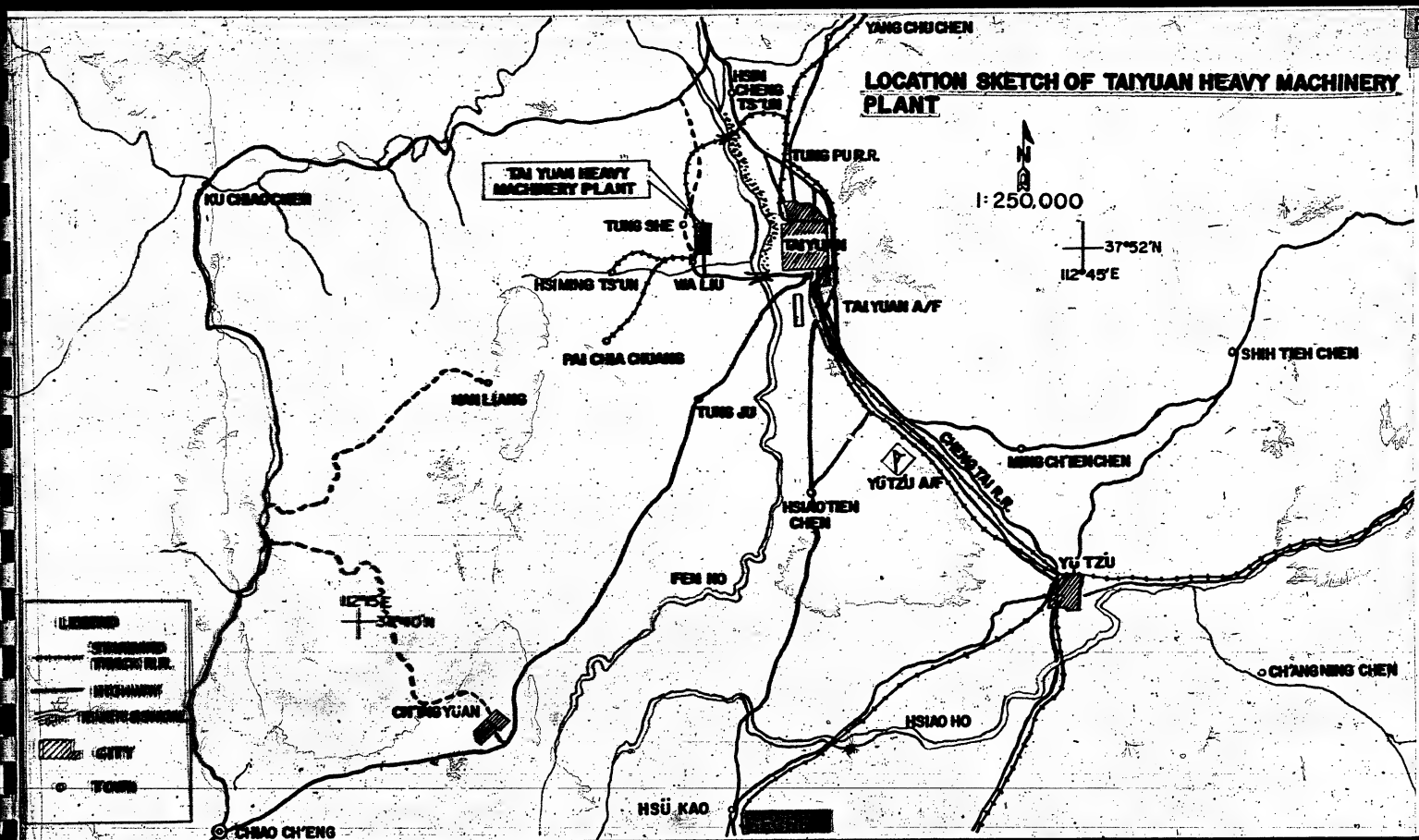
- (9) "Chicom References", Ministry of Judicial Administration, Oct 1962.
- (10) "Mainland Communications Intelligence", 20 July 1961.
- (11) "Climate Data of East Asia Vol. 1, China", Central Meteorological Observatory, Japan, Jan 1941.
- (12) Agent Report, 23 Jan 1964.
- (13) Kung Jen Jih Pao (Worker's Daily), 20 Mar 1959; Ta Kung Pao, 27 Sep 1959.
- (14) Jen Min Jih Pao (People's Daily), 20 Sep 1963; Chou Mo Pang (The Weekend), 20 Apr 1959.

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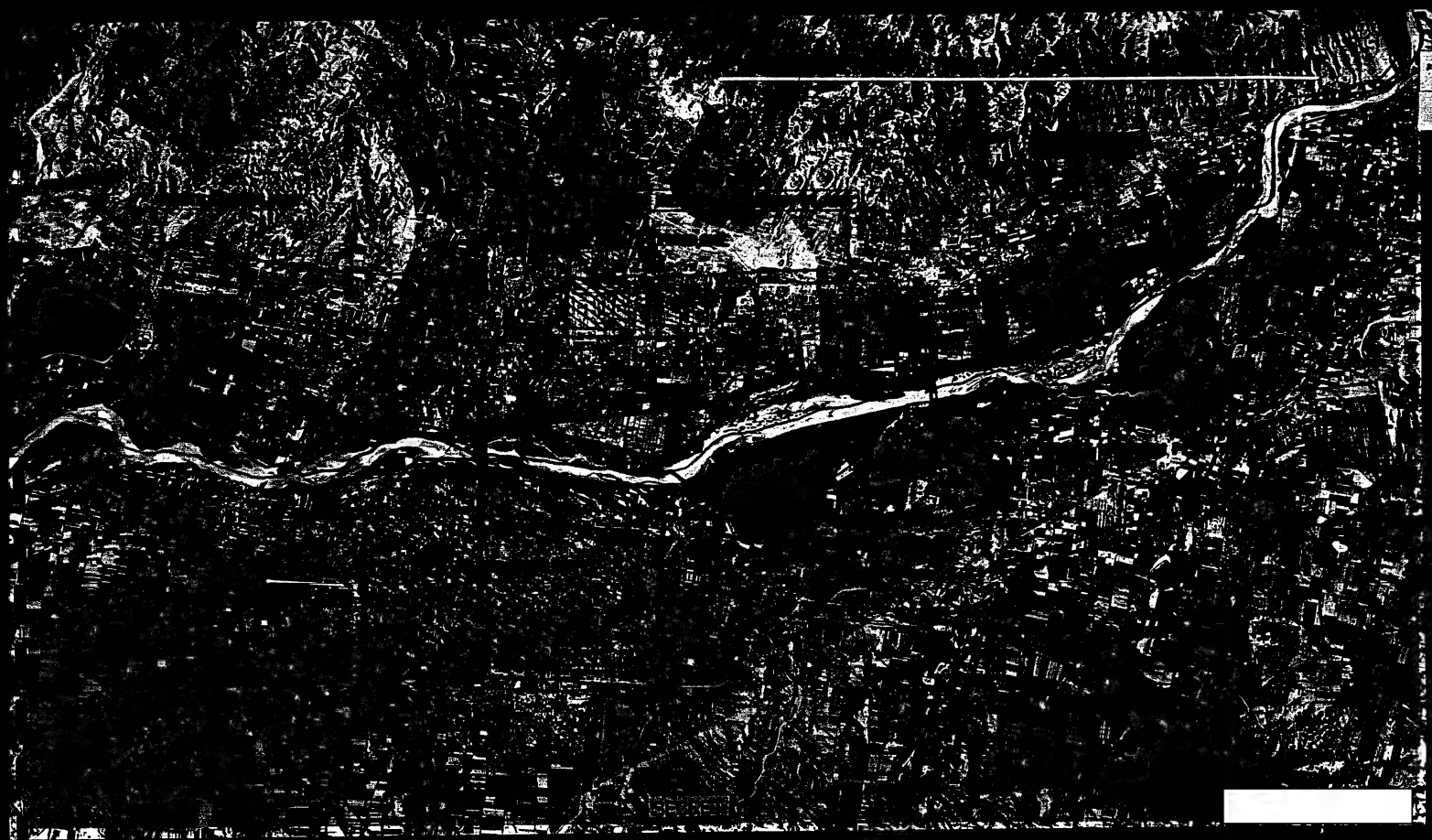


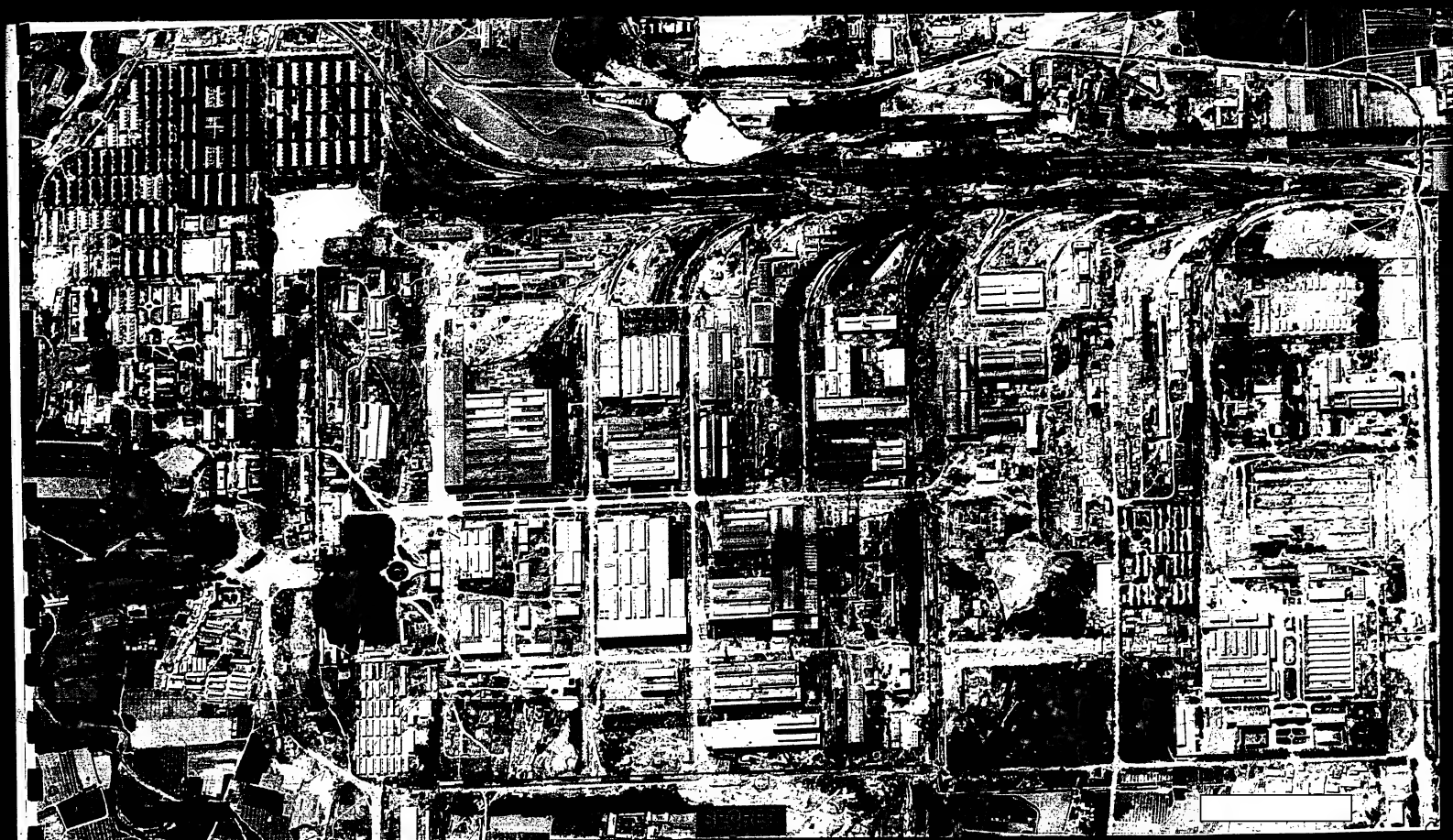
c. Maps:

- (1) Topographic map, Taiyuan F-AMS J49Q, 1: 250,000.
- (2) Topographic map, Yangchu (Taiyuan) and Hsi-ming-ch'un, 1: 50,000.

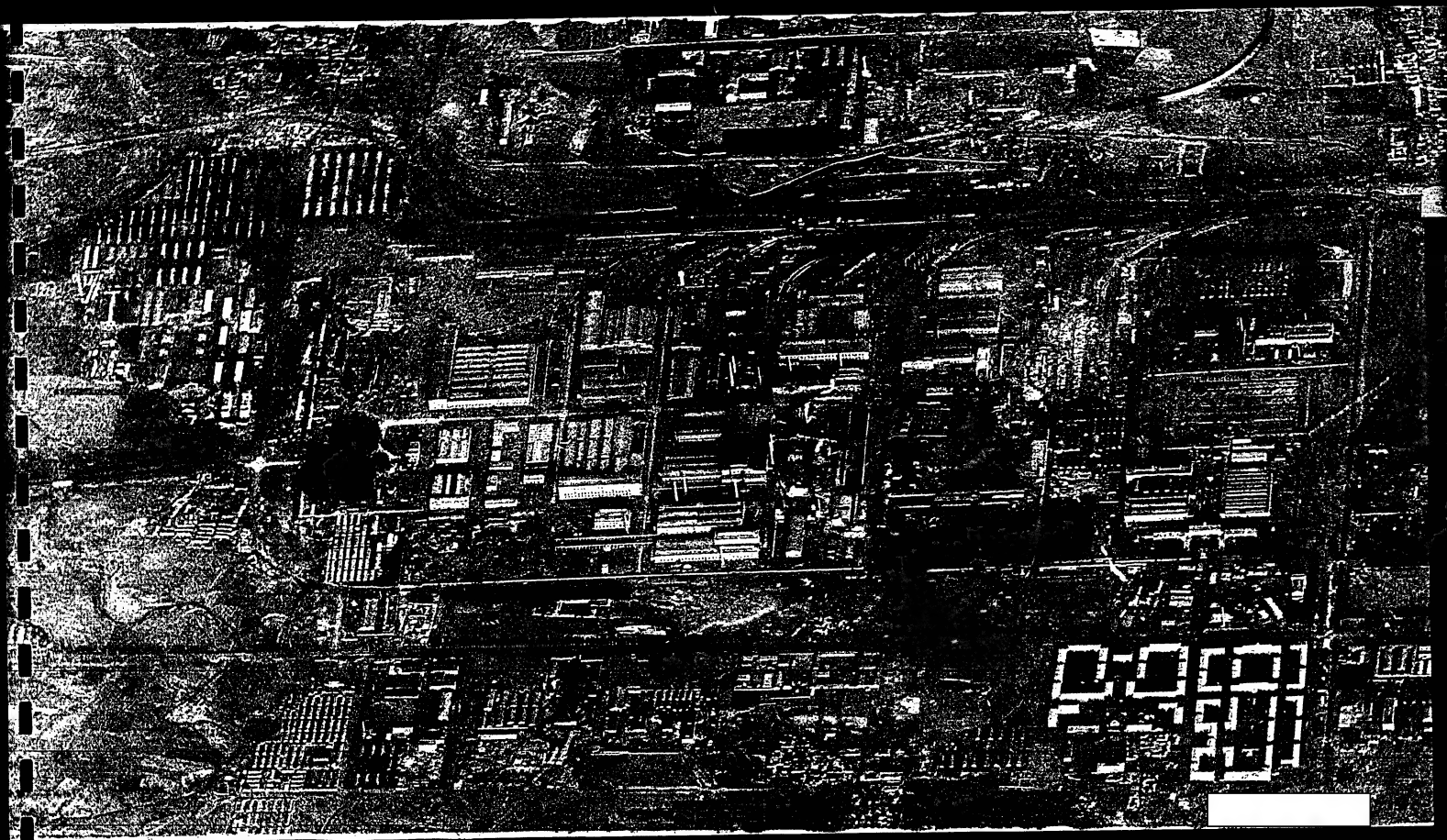








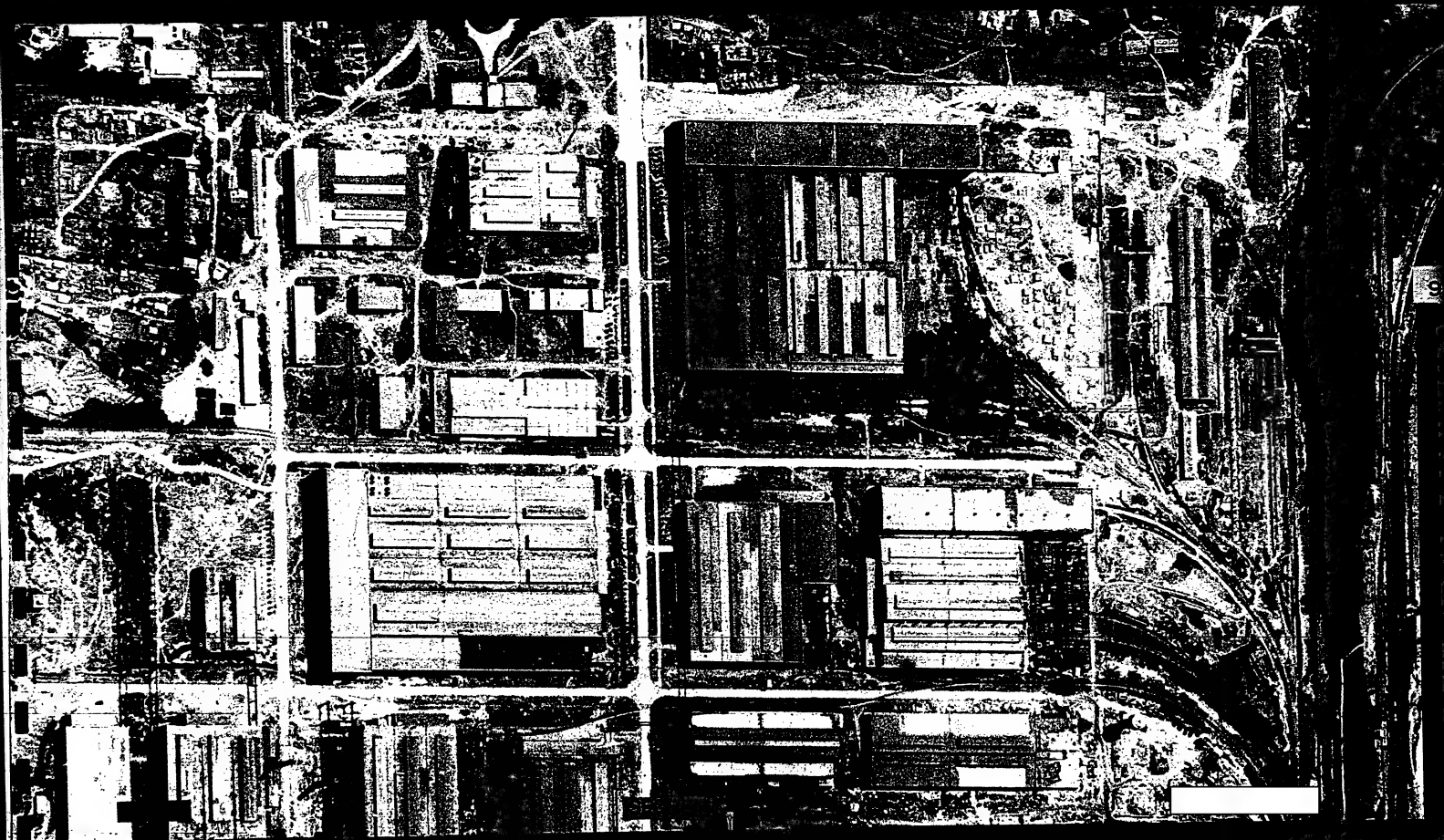


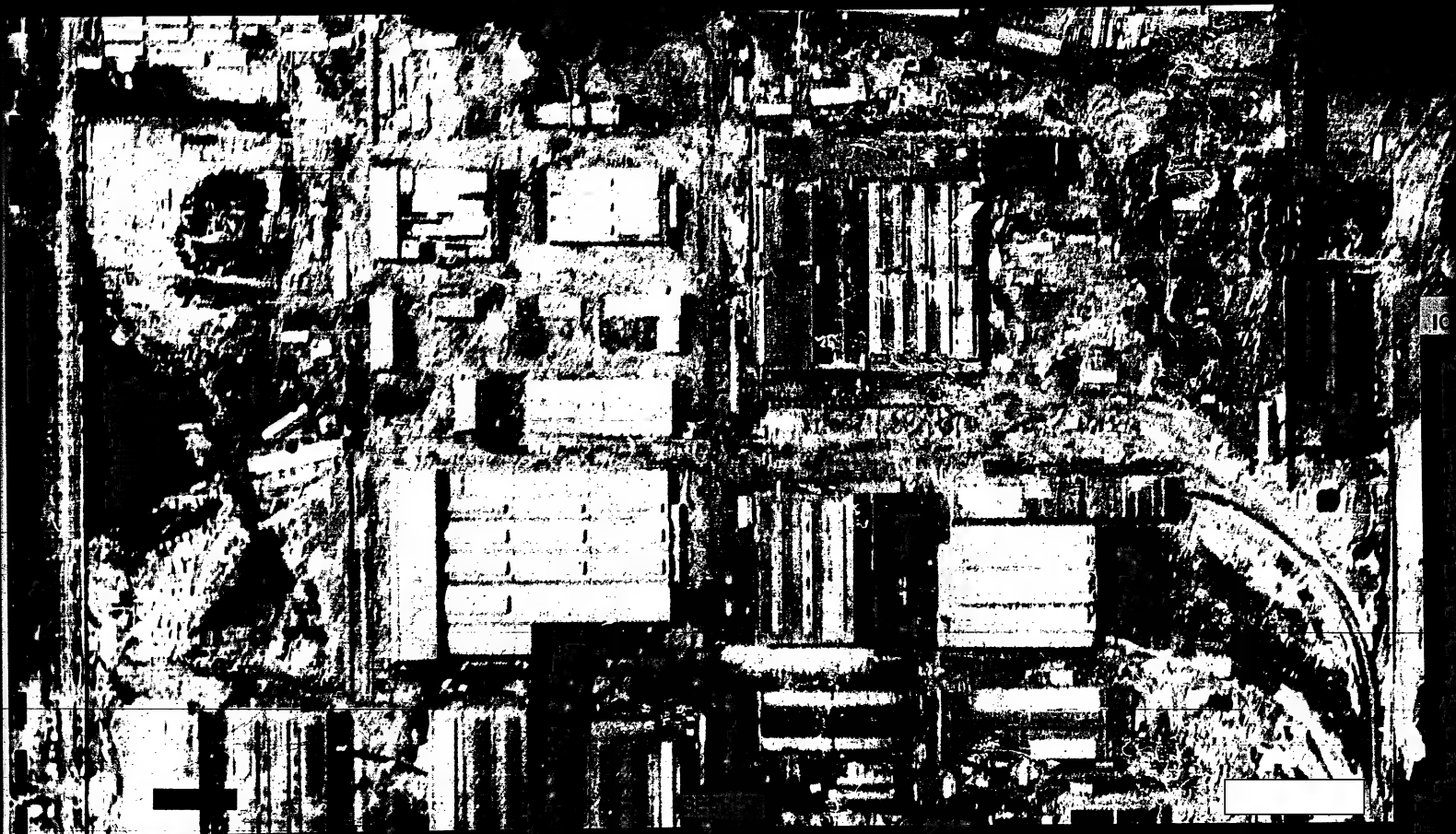






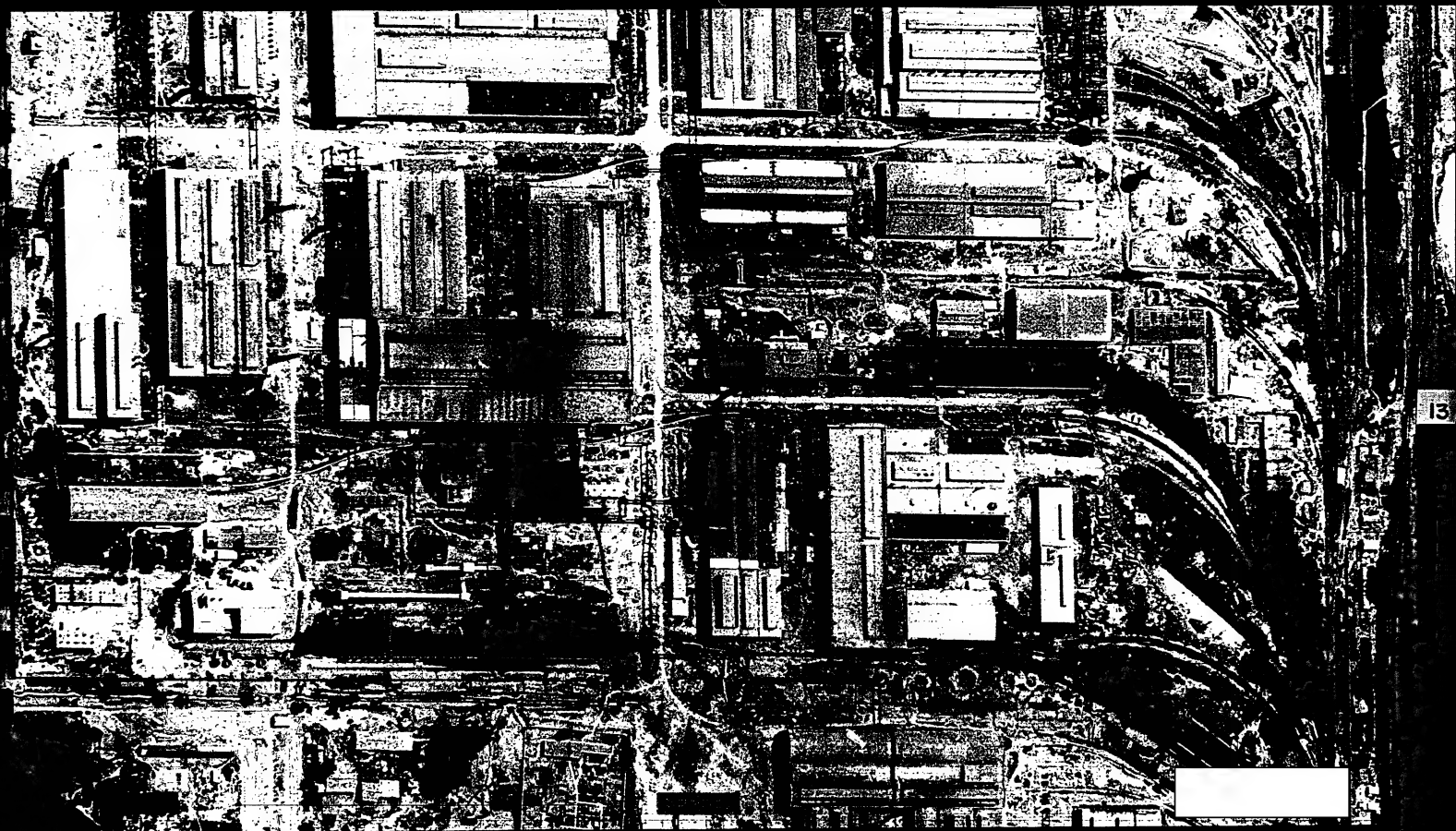
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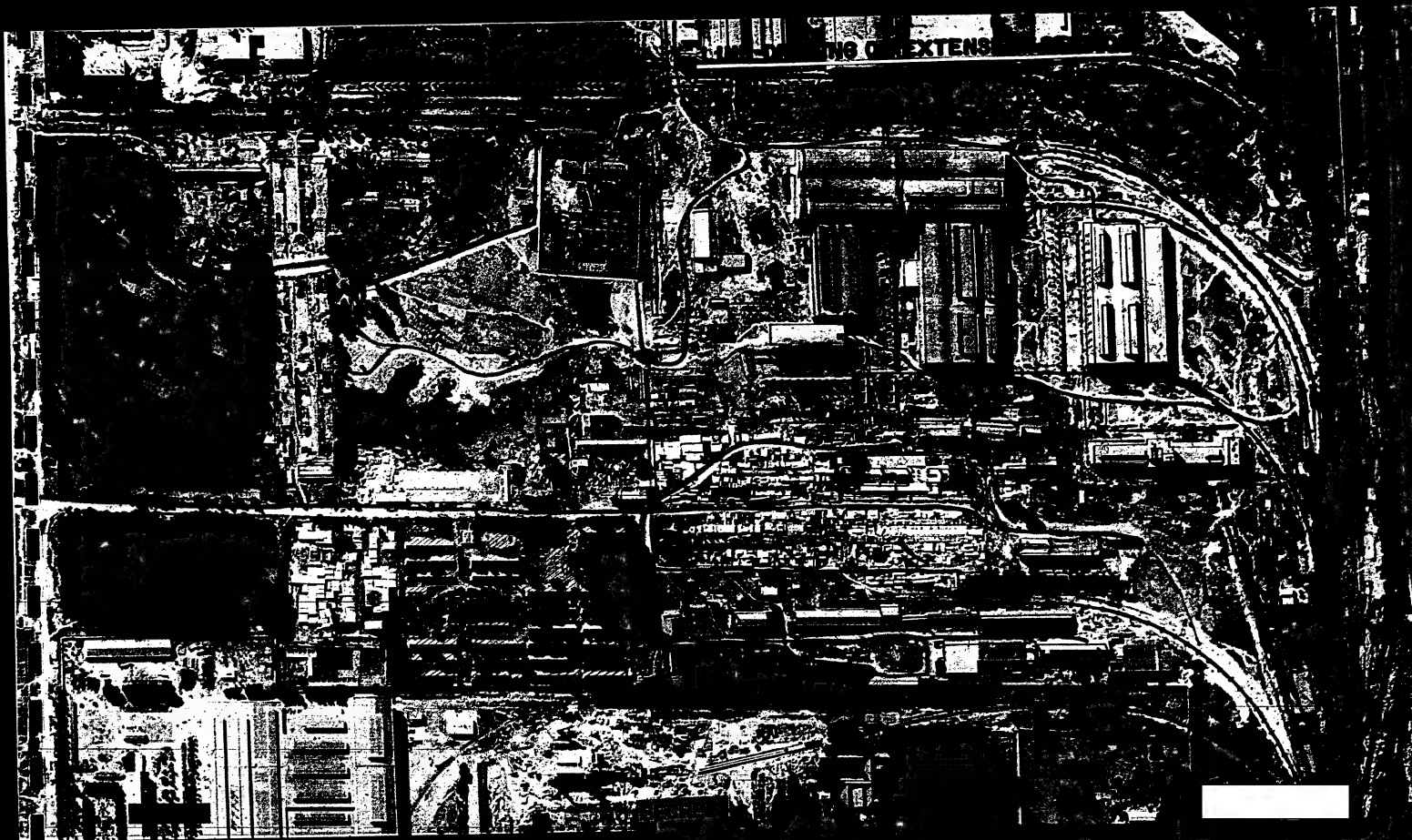


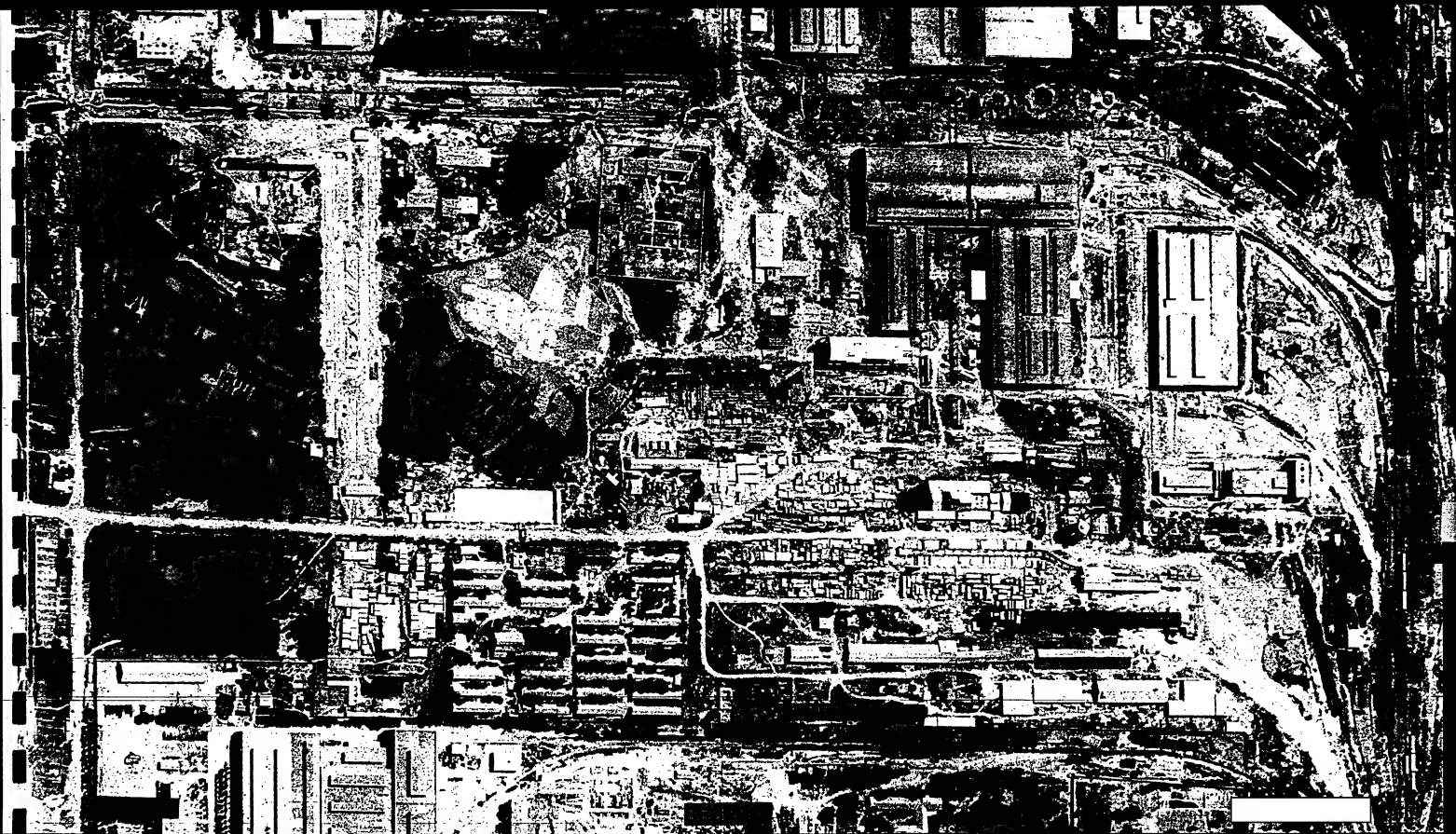


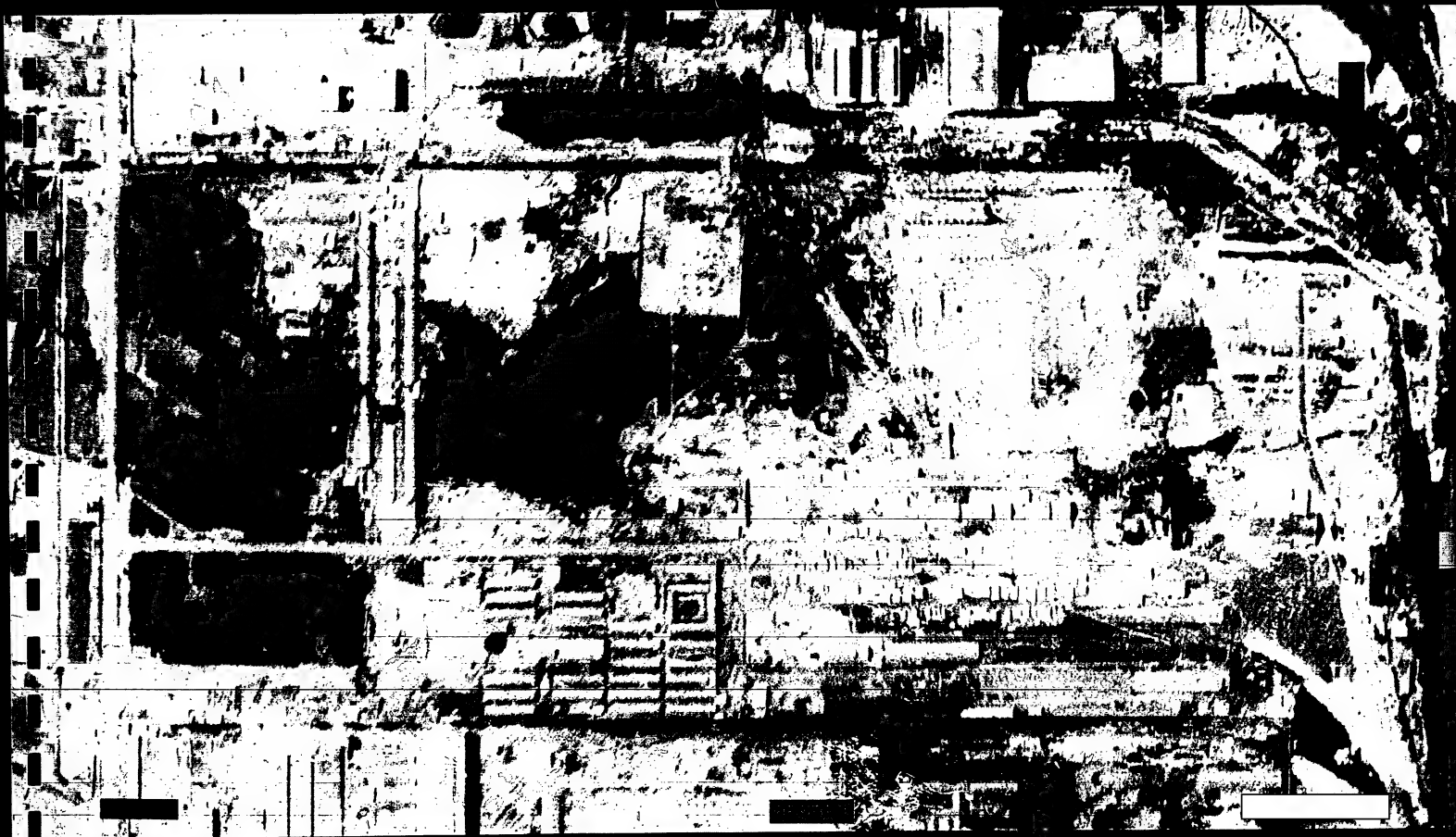






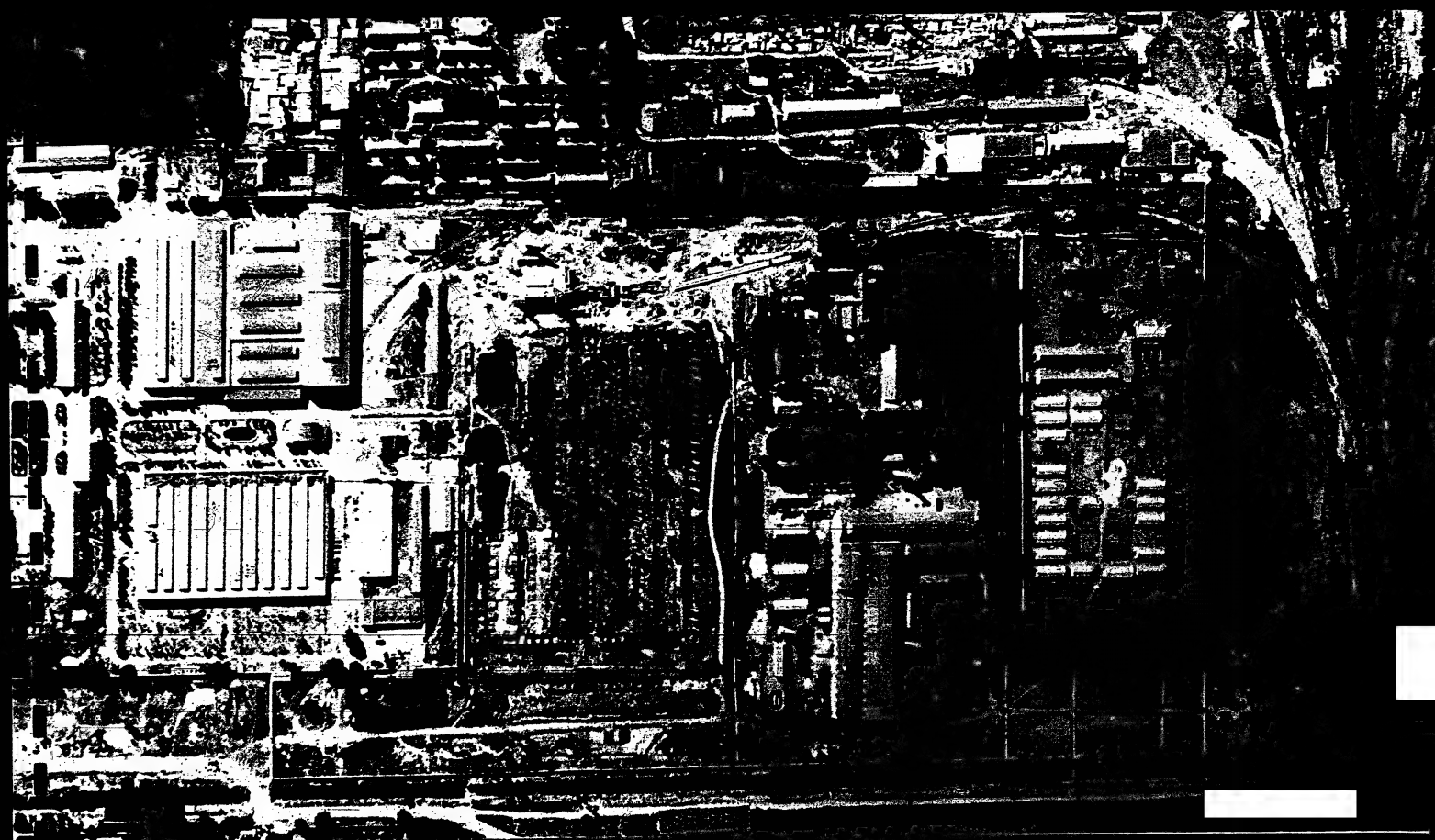


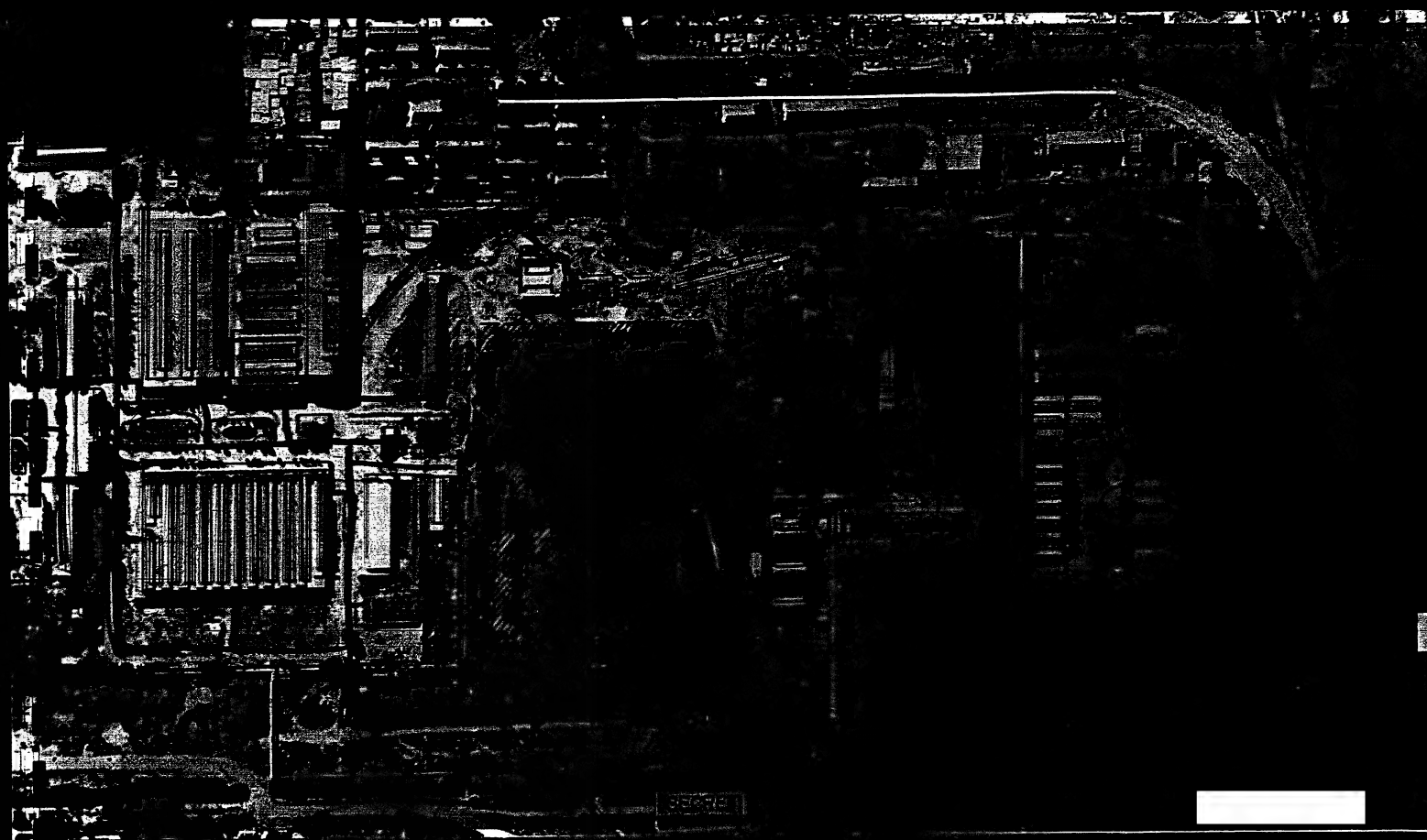


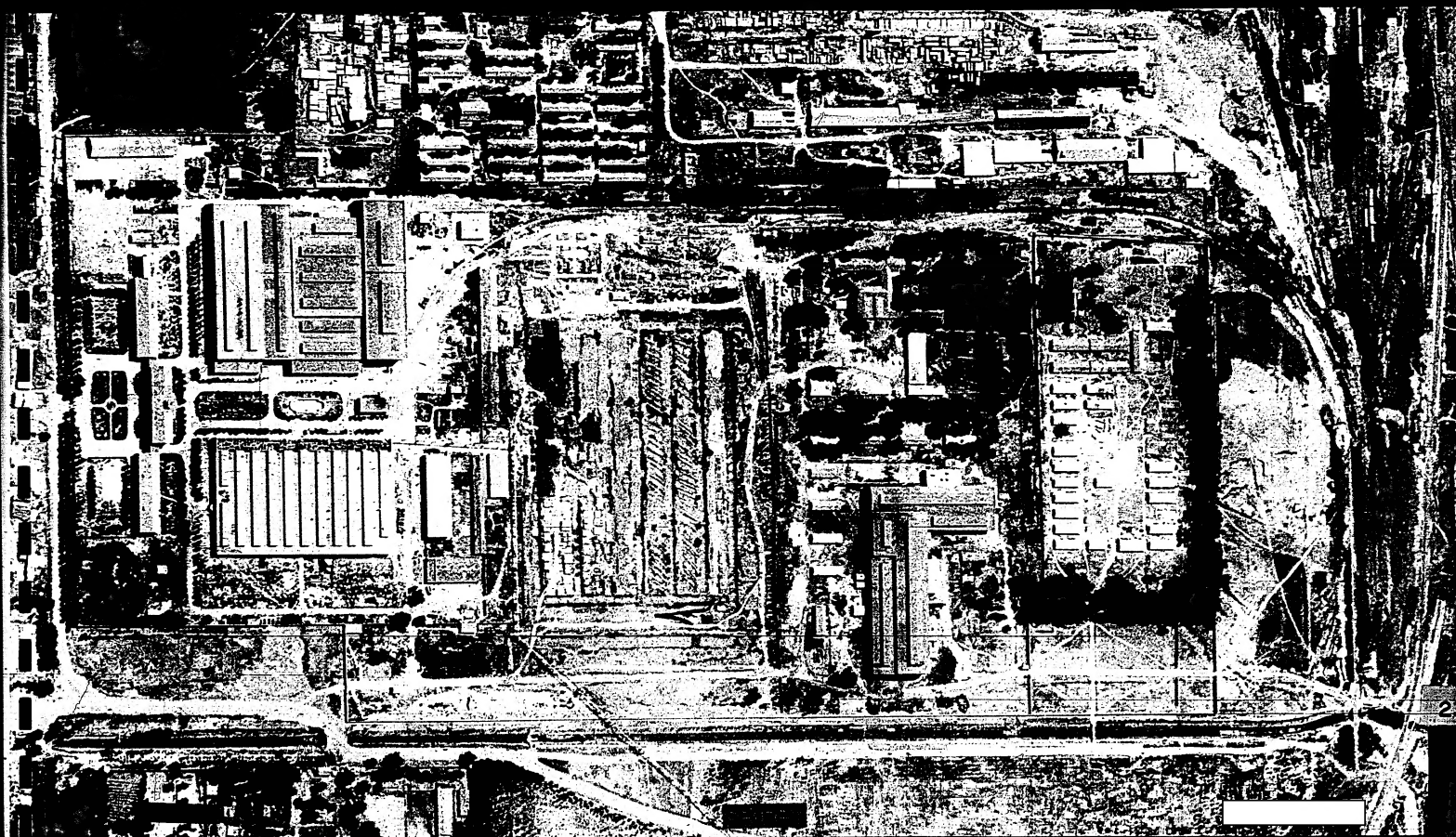


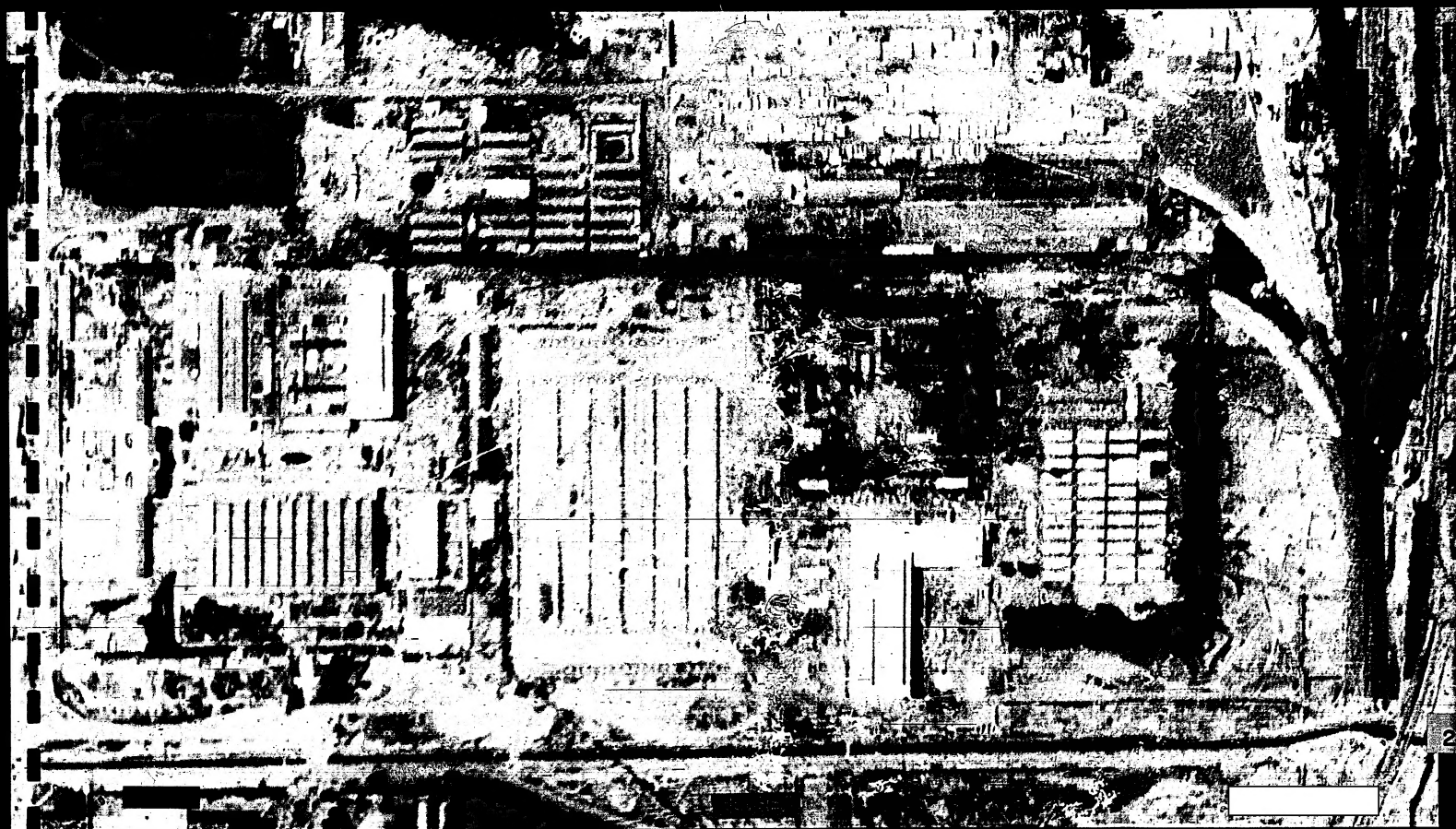


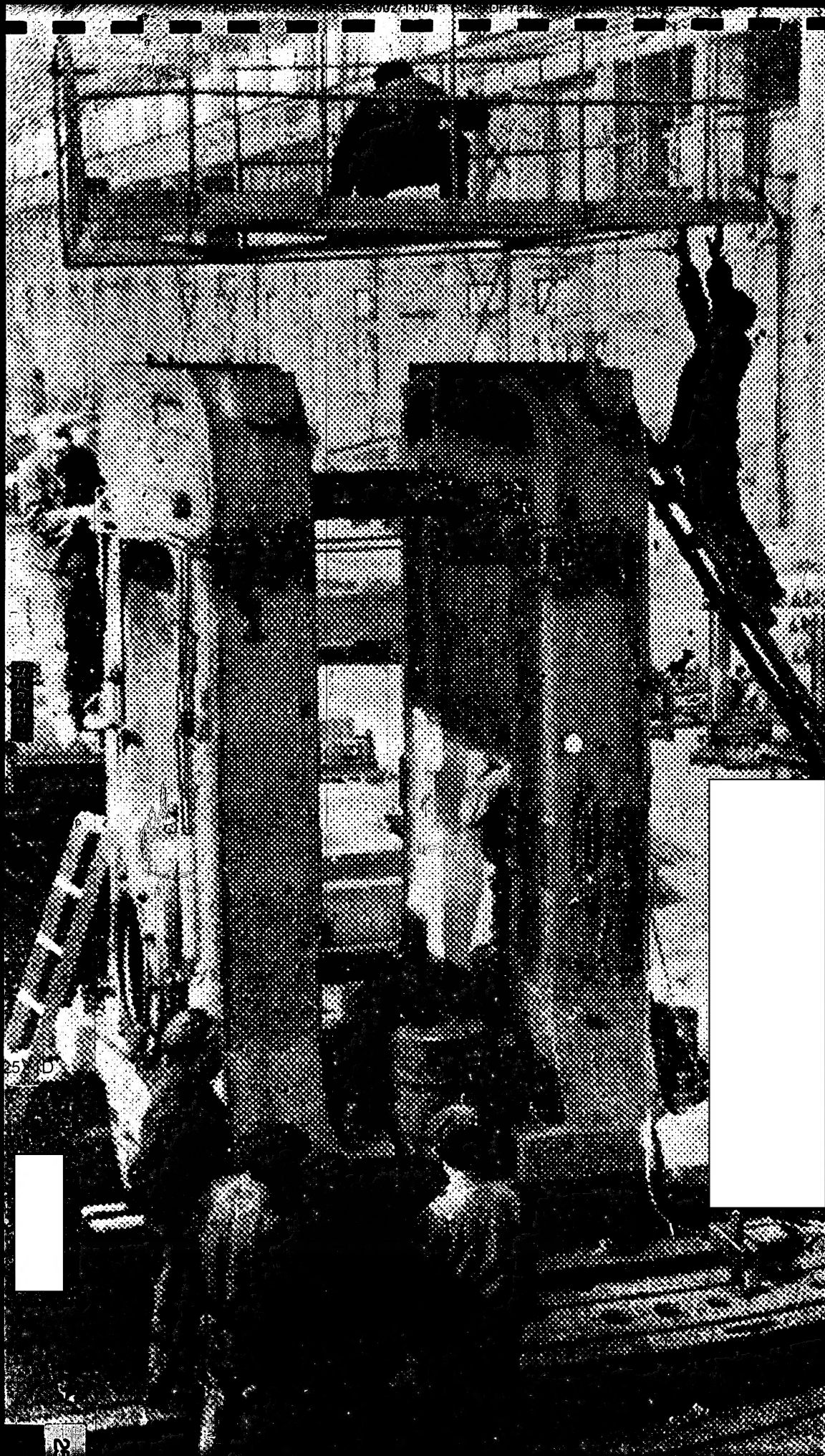


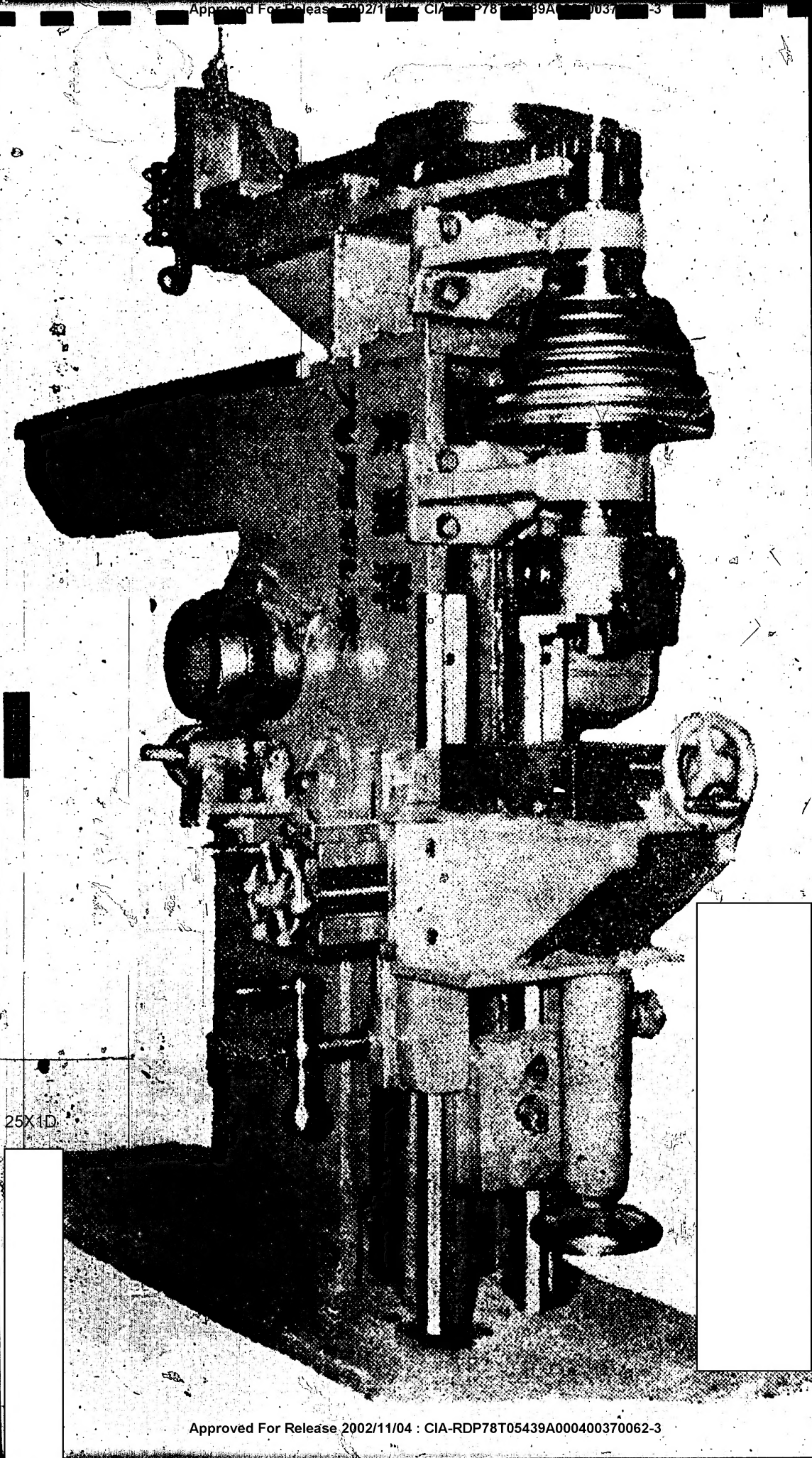












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